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The Beattie Smith Lectures.

(MELBOURNE UNIVERSITY).

ON INSANITY.

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LECTURE II.

DEATH comes to the insane patient as it does to the sane through disease of tissues and organs and in the majority of the patients in hospitals for the insane the causes of death are (except in epidemics) of the same kind as those that take place among the sane population. The death rate of the hospitals for the insane corresponds for the different times of the year with the death rate of the district wherein the hospital is situated. There are, however, certain peculiarities which may be mentioned. These are cases of steadily progressive dementia where the effect of the brain degeneration upon bodily functions becomes pronounced. Changes in the sensory and motor areas in this class of patient follow the changes in the prefrontal region and restricted muscle movements with lack of response to environment are the result. Life in an invalid

chair and trophic changes soon follow. The patient becomes progressively wasted and dies quietly from exhaustion. This is known in the cant of the hospital medical men as a "brain death," because at the autopsy the outstanding feature is the extreme wasting of the brain and the absence of acute disease of other organs. A terminal infection, sometimes pulmonary and sometimes bowel in origin, is the usual end of the enfeebled insane.

There is a peculiar exaggeration of pathological conditions found in the mortuary of a mental hospital. This is probably due to the fact that the prolonged chair and bed nursing of a patient, demented and with no energetic response to stimuli from within or without, tends to prolong life to a stage at which the pathological changes would have long since terminated the life of a sane individual. Mental disease curtails life in an indirect manner. When the judgement, instincts and will power are singly or collectively impaired, alteration in the conduct and behaviour to the detriment of the general health follows. Thus neglected constipation, indiscriminate in diet, inattention to injuries, disinclination to take exercise and other infractions of the laws of hygiene all contribute to the production of physical disease and death. Other factors also due to the mental state of the patient tend to cut life short.

These are prolonged excitement, restlessness, perversions of all the instincts which make for the preservation of self and abnormal practices prompted by delusional ideas.

The pathology of insanity is the pathology of the nerve cell, but as the brain cells governing the mind of an individual are dependent upon the good health of the rest of the body, the pathology of insanity embraces the pathology of the individual as a whole. Gross intracranial disease, such as tumours and hydatid cysts, by their mechanical effect upon the blood supply of the neurones, can cause mental symptoms, but comparatively few insanities owe their origin to these. The most active insanities from a public safety point of view, such as acute melancholia or acute mania, may be accompanied by no macroscopical changes in the brain, except some alteration in the blood content, but microscopically damage to the neurones will be evident. Because *post mortem* examination of the brain in acute insanities revealed no gross pathological changes, the psychoanalysts decided that insanity was purely psychical. With the work of Mott, Lugaro, Watson, Bolton and others available it is hard to understand how they cling to that opinion.

When an individual reaches the age of twenty, further development of the normal brain takes place by elaboration of the association system more than by any great increase in the weight. This elaboration is said to take place through an increase in number of the fibres of the tangential system, chiefly the outer line of Baillarger and the supra and interradian fibres. This proceeds until the period of middle life is reached, when a gradual diminution of these fibres commences.

From this and the facts mentioned in the preceding lectures it may be realized that from birth till middle life the normal process of mind elaboration can be interrupted by stresses. Certain forms of idiocy and primary dementia are produced in this manner. The first effect of a stress upon the nerve cell is chromatolysis and if this persists beyond the recovery mark, achromatolysis and complete destruction of the cell take place. Central nervous tissue does not regenerate when once destroyed, so the disappearance of the cells and their fibres reduces the volume of the brain. Owing to the rigid nature of the skull in order to compensate for this shrinkage the ventricles dilate and the piaarachnoid becomes oedematous with cerebro-spinal fluid. The oedema of the piaarachnoid is called *hydrocephalus ex vacuo*, or external hydrocephalus and in destructive brain disease where localized atrophy has taken place it has the appearance of a large cyst. As a rule the greater the hereditary influence in the production of insanity, the more do the convolutions show a tendency to depart from the normal standard pattern. This is seen in an exaggerated form in congenital insanity where phyletic degeneration is very evident. Macrogyria and heterogyria indicate maldevelopment of the cortex and are present where the hereditary influence is strong. Microgyria most commonly seen in idiots may be due to undevelopment of convolutions or to atrophy of

convolutions. When there is no dementia present, there will be found at death no macroscopical changes in the brain itself, although there may be changes in the vessels, membranes and calvarium.

Care must be taken not to confuse dementia and temporary feeble-mindedness. The latter accompanies most of the acute insanities, but clears up with mental improvement. In primary dementia the early phases of the disease are stupor and a confusional state and there is no wasting of the brain detected at autopsy in patients dying at this stage. When, however, dementia commences, the brain cortex begins to shrink, notably in the prefrontal area and compensatory changes appear. A patient may be extremely feeble-minded owing to a recoverable chromatolysis, for example in stuporose or confusional conditions or even in the sane after a severe illness, but when the feeble-mindedness is due to achromatolysis, it is a permanent condition. When the stress has been of some duration, there may be seen changes in the other intracranial contents which may be contributory factors to the impaired nutrition of the cells, for example, a thickening of the meninges or vessel walls may cut off blood supply from cells which are only just keeping ahead of chromatolysis or achromatolysis.

In patients suffering from recurrent insanity without dementia who have been exalted, depressed and temporarily feeble-minded in succession, the feeble-mindedness is only of a temporary nature and the *post mortem* examination of such patients who have died from some intercurrent illness, shows no sign of wasting in the brain. In these examinations the size of the skull must be recognized as indicative of the mass of the normal brain only during the years of development. In the normal brain after the age of forty-five years (and at any time in the idiot) the weight of the brain decreases and the ventricles dilate in a compensatory fashion. The normal senile wasting of the brain is general, while the wasting of dementia takes place mainly in the prefrontal region. Pathological changes in the vessels, membranes and all other intracranial contents other than the nerve tissue must be considered from either of two standpoints; first, as the cause of the malnutrition of the neurone by interference with the blood or cerebro-spinal fluid and secondly, as an accompanying pathological condition due to the same cause which has exerted its deleterious effect upon the neurone. An example of the former may be seen in arteriopathic dementia with its diseased vessels and thickening of the piaarachnoid in chronic epilepsy may be cited as an example in the latter.

Just as it is impossible to say when looking at a section of cloudy swelling of the liver under the microscope what particular toxin is responsible, so it is impossible in many cases to say what agent has caused the changes in the neurone in insanity. In some types, however, the cause is manifest. In general paralysis of the insane the constancy of the changes in the brain and membranes makes the diagnosis macroscopically and microscopically easy, as is also the case in organic dementia with arterio-

pathic changes. There are also appearances in the calvarium and membranes which also have a significance in the pathology of mental disease. The eburnation of the calvarium and massive hypertrophy of the inner table indicate chronic congestion and a fine honeycomb pattern on the inner table is due to vascular tufts of the *dura mater* produced by syphilis. Thickness of the *dura*, subdural deposits such as *pachymeningitis hæmorrhagica* and degenerative changes in the basal vessels of the brain, have all of them a significance in the study of the pathology of insanity.

There may be chronic changes in these tissues although the duration of the mental symptoms is quite recent, showing that the stress has been of long duration before the mental symptoms eventuated. For example a woman of thirty-five died from acute confusional insanity. At the autopsy the pia-arachnoid was found thickened and there was sclerosis of the liver and kidneys, but there was no wasting of the brain. The thickened pia-arachnoid and the sclerosis of the viscera pointed to long standing irritation due to the same cause which ultimately affected the neurones. Another example is that of an old man with a normal senile wasting of the brain with thickening of the cerebral vessels. He develops mania, the clinical picture of which is that of ordinary mania modified by the presbyphrenia of old age and probably caused by the failing efficiency of the kidneys or autointoxication from the bowel.

As the neuroglia is the connective tissue of the brain, it becomes proliferated when chronic irritation is present. When it does this in the subependymal layer, it heaps up the ependyma in minute granules called "frosting" from its appearance. The floor of the fourth ventricle shows this appearance in syphilitic infections of the central nervous system. In many chronic dementias this frosting is seen in the lateral recesses of the fourth ventricle, but the lower half or all the floor of the fourth ventricle must be covered to justify a diagnosis of parasymphilitic disease. In hydrocephalic idiocy, the lateral ventricles are frequently found lined with very coarse granules of the ependyma. In epileptics an unusual intensity of sclerorosis of the *cornu Ammonis* is frequently present, besides a sclerosis of lesser degree in other parts of the brain. Reference to more particulate pathological changes will be made when discussing the different types of insanity.

VARIETIES OF INSANITY.

There are many types of insanity recognized. The type depends upon one or more of the following factors:

- (i.) Behaviour reaction of the individual due to his mental equipment.
- (ii.) The period of life at which the insanity develops.
- (iii.) The nature of the stress.
- (iv.) The organic reaction present which destroys cells and fibres.

The condition of the paranoiac is an example of the behaviour reaction of the individual. In primary

dementia is seen an example of the time of life at which insanity develops. Korsakow's disease is an example of the nature of the stress present and general paralysis of the insane and arteriopathic insanity are examples of the organic reaction. Healthy people do not all behave in the same manner in identical circumstances, for example, if prevented from acquiring something greatly desired, one man will become angry and try force, another will be depressed and retire from his fellow creatures to brood over his disappointment, while a third feels wronged and ascribes his failure to the interference of others who are jealous of him. This is known as behaviour reaction. In mental diseases these tendencies to react in certain ways are still present and stand out in exaggerated form and explain the personal variation in the mental symptoms. The behaviour of the insane man like that of the sane is a reaction to some situation. A general paralytic is suffering from a structural disease which progressively destroys his brain and as all types of individuals are affected we get different types of reaction.

The changes in nerve cell function may be an increase or a diminution. Toxic substance may give an initial increase replaced by diminution, as in alcohol. In a general way, it may be said that toxins more frequently produce the phenomena of overaction, are of more acute onset, shorter duration and less permanent than those due to other causes.

There are many classifications and the apparent difference in diagnosis given by alienists who are using a different nomenclature, is very puzzling to the layman. The legal profession avoid all this confusion by concerning themselves with the evidence of insanity as shown by symptoms. They are not concerned with the diagnosis as a rule, still the alienist should be prepared with a diagnosis in case he is asked for it. A counsel usually wishes to prove an individual sane or insane in regard to the matter in hand only, it is perhaps prudent to refrain from giving a diagnosis of the type of insanity present unless asked for it, as it might be seized upon by an opposing counsel as a means of trying by a rigorous cross-examination to discredit the medical opinion already expressed.

Insanity may be congenital or acquired. The former means mental defect observed soon after birth or during early childhood. The latter means mental disease in a person hitherto sane.

Congenital Insanity.

Congenital insanity is referred to sometimes as amentia to indicate that the mind had not been formed or as some say "mind lack" to distinguish it from dementia which is "mind decay" or "mind loss." There are several degrees of congenital defect, idiot, an old word meaning uninformed or unlearned, imbecile, meaning weak or destitute of strength whether mentally or physically and moron, meaning a foolish one. The idiot is the most devoid of intelligence and the moron the least so. Brain myelination is not completed till several months after birth, so congenital insanity may be due to

structural defect inherited from parents or disease acquired at any time before the completion of full brain myelination. Members of the first two classes, the idiot and imbecile, are sent to institutions as a rule, as they are no ornament or use about a dwelling and to keep them at home and in the background requires a very deep purse indeed. Some of the higher grade imbeciles are kept at home to do scrubbing and such work, but the danger of sex in the case of the female is an ever present one. Unfortunately for our racial standard the third class or morons are not segregated and roam the country as tramps or have unsettled occupations in which little intelligence is required and personal character and morality do not count as assets. They spread venereal disease because their uncontrolled primitive instincts make them promiscuous in their sexual gratification. All congenital mental defectives, whether they be certified and living in segregational institutions or uncertified mental defectives free to roam at large until they fall into the hands of the police for some transgression of the law, have the same peculiarity. Their judgement and reasoning are overbalanced by their primitive organic instincts and this leads them to excesses and all manner of infractions of the laws of hygiene and of the society to which they belong. Many of them have a native cunning which is sometimes mistaken for intelligence. The diagnosis of idiocy and imbecility is a comparatively easy matter, but to demonstrate with conviction to a bench of justices of the peace in the case of a moron that the accused individual has transgressed more because he "cannot" than because he "will not" obey the laws of society and is therefore more fitted for a segregation colony than a gaol or reformatory, is a task which requires considerable experience. This requires medical knowledge and a familiarity with various intelligence tests for determining the intelligence quotient and mental age. These tests are based upon the time in which certain standard questions are answered and certain pictures explained. The Binet-Simon, the Terman and the Yerkes point scale tests are used to determine the mental age and the I.Q. or intelligence quotient which is the mental age divided by the chronological age and multiplied by one hundred. In adults sixteen is used as the divisor, as the maximum result is usually acquired about that age. There are certain objections to the tests, such as unequal opportunity to acquire knowledge and the variability in temperament, instincts and sentiments. The classification is as follows:

Idiot, mental age below two with intelligence quotient between 0 and 25.

Imbecile with mental age between two and seven with intelligence quotient between 25 and 50.

Moron, mental age between seven and twelve with intelligence quotient between 50 and 75.

Backward persons with intelligence quotient between 75 and 90.

The average mental age of the men drafted into the American army in 1918 was twelve, with an intelligence quotient of 81.25 as against a normal of

100. The social conception of feeble-mindedness recognizes the enfeeblement by the result of the defect, such as the inability to earn a living under favourable conditions. The psychological conception of feeble-mindedness by the aid of empirical tests anticipates the danger and helps to prevent it. The Education Department of Victoria is working upon these lines at the present moment, but as these tests by themselves without the assistance of other forms of examination of an essentially medical character are inconclusive, it would be better if this work were done by medical men or women. In congenital insanity the departure from the normal is indicated by stigmata of degeneration and the dwarfing of the stature. It is not the solitary stigma, but the plurality of stigmata which is significant. The difficulty of diagnosis during early childhood is to determine whether a child is merely backward in learning to talk or walk or whether it is mentally deficient. A backward child is usually normal for a child of younger age, while a defective child is defective for any age. In older children if the discrepancy between the mental and chronological age is less than three years, the child is regarded as simply retarded or backward. Besides such defects as inability to walk, run, grasp, feed, keep clean, respond to friendly overtures, imitate and other qualities found in the ordinary child, the defective child shows stigmata of degeneration in the ears, teeth, palate, genitals, crown of the head, feet, hands *et cetera*. By itself the shape of the head which follows the contour of the brain may be sufficient for diagnostic purposes.

Maldevelopment and damage by disease or birth injury have produced in these individuals a brain incapable of normal function. As the new-born child is idiot and grows out of that state only by its natural development and education, it can be easily appreciated that any disease which prevents that development in infancy, will create an idiot or imbecile according to the degree of impairment. This is what happens in syphilitic and other forms of meningitis occurring in early infancy. In other cases the maldevelopment is embryological, producing a brain incapable of normal function.

Closely allied to persons suffering from congenital insanity are ill-balanced individuals whose mental organization is asymmetrical because of excess or diminution of development in one or another direction. Many eccentric geniuses belonging to this class are highly gifted upon special lines but lack in general balance. They may be described in the words of Dryden:

Great wits are sure to madness near allied
And thin partitions do their bounds divide.

Another type called "idiots savants" are idiots who are apparently abnormally developed to the state of genius in one particular sphere, the remainder of their mental equipment being below the standard.

There are several types of congenital insanity recognized, but time will permit of only a few words to describe the most commonly seen.

Congenital Insanity with Epilepsy.

Congenital insanity with epilepsy is epilepsy associated with congenital insanity. A number of the epileptic children who are in the idiot cottages at Kew were once practically normal children who developed epilepsy and gradually became demented in course of time. They are not suffering from congenital insanity with epilepsy. Others segregated in the same institution are congenitally insane and have developed epilepsy during the first year of life or the onset of epilepsy has been delayed until the child has been several years in the institution.

Mongolism.

Another type is the Mongol idiot, characterized by a flat face with high cheek bones, oblique eyes which give the type its name, fissuring of the tongue, spade shaped hands and other peculiarities. The degree of idiocy varies from the fairly intelligent type to that of helpless stupidity. Many of this type are kept at home, judging by the number of the higher grade Mongols one meets in the street, but the useless ones are usually sent to institutions. Some appear to show response to thyroid treatment up to a certain stage, otherwise there is no line of treatment at present known.

Cretinism.

The cretin owes its idiocy to deprivation of the thyroid gland function. The daily use of thyroid improves the physical condition, but the mental improvement is not so satisfactory, probably because the defect in the gland was present at the time of early mental development. Grafting of human thyroid tissue into the abdominal cavity is recommended where the mental recovery under treatment with thyroid by the mouth gives hope of a complete cure.

The microcephalic idiot has a very small head, giving a bird-like expression to the individual. The mentality is low and there is no treatment.

Hydrocephalic idiocy is produced by the slow pressure of chronic internal hydrocephalus. The head becomes wedge shaped on account of the upper portion swelling out in response to the internal pressure. There are frequently found obstructions in the connecting narrow channels between the lateral and fourth ventricles. There is no treatment.

Epiloia.

Epiloia is a form of idiocy associated with epilepsy, a skin disease called *adenoma sebaceum* and hypertrophic sclerosis of the cerebral cortex. The lateral ventricles show a "candle guttering" appearance and there are associated growths in the cortex of the kidneys in most of the cases examined *post mortem*. The condition is hopeless.

Acquired Insanity.

Attempts to classify acquired insanity have been made from symptomatology, pathology and the causative agent. The terminology now generally accepted, like the principles of banking, is the result of custom and use rather than of scientific arrangement.

To illustrate the difficulties of arranging a classification in insanity, no better example can be found than the name given to the disease known as general paralysis of the insane. In this disease the most striking symptom may be feeble-mindedness, mania or melancholia, some of its pathological changes are present in other diseases and it is only one of the many results of syphilis. The name *dementia paralytica* or general paralysis of the insane is therefore given to this variety to designate its particular group of symptoms.

Again take primary dementia with its various clinical manifestations of stupor, confusion, exaltation, depression *et cetera* and it will be recognized that classification by symptoms alone is impossible.

The following classification will be found a useful working one.

Manic Depressive Insanity.

Manic depressive insanity is the name given in recent years by Kraepelin to mania, melancholia and circular insanity, under the assumption that they are phases of the same condition. The term is now generally accepted, but so long as it is recognized that the tendency to oscillations of moods in ordinary life are preserved in conditions of exaltation and depression, there is no justification for giving up the older terms of mania, melancholia and circular insanity. There are many patients suffering from mania and melancholia who do not manifest alternating attacks of mania and melancholia.

Mania.

Mania is a state of morbid mental exaltation whether wrathful or joyous. Excitement is present and there may be special features, such as delusions, that earn for it the distinction of belonging to a subvariety, as for example delusional mania, homicidal mania or recurrent mania. Usually the rapid flow of thought causes such incoherence, divertibility and motor restlessness, that the patient is inaccessible. Confusion of identity is not uncommon and the judgement is upset. As in nearly all other insanities, there is in this type a preliminary stage of depression, in some instances so short that it is overlooked owing to the onset of the more noticeable exaltation. Whereas melancholia appears to be the result of exhaustion, mania has the appearance of intoxication.

Acute delirious mania has the appearance of an acute intoxication, the clinical picture being that of an intense delirium in which the patient is liable to make attacks of violence upon those in attendance in an unreasoning attempt to get away from control. There is reason to believe that a large number of these patients, if not all of them, are syphilitic. The *post mortem* findings in these cases include chronic changes indicative of long standing toxæmia and intense recent toxæmia. Death in a few days' time from exhaustion is a common ending. Some very early cases of general paralysis of the insane commence with similar symptoms.

Agitated Melancholia.

Agitated melancholia belongs to the mania group rather than to the melancholias, as there are

extreme motor restlessness and low blood pressure in contrast with the paralysis of movement and high pressure of the melancholia. The patients suffering from this type are nearly all of the Celtic race, it being apparently a racial behaviour reaction to depression. The clinical picture may be described as an exaltation of grief.

Melancholia.

Melancholia is a state of morbid mental depression. Paralysis of volition is present. Ideas of unworthiness and apprehension may lead to suicide or homicide. Homicide in the case of the melancholic is directed against loved ones in order to put them out of the way of harm at the hands of a supposed enemy, disease or want. This exemplifies the method of reasoning of the insane. The brain of the melancholic patient is anæmic in contrast with the brain of the maniac. When melancholia turns to dementia, there is wasting of the brain with compensatory changes in the ventricles.

Non-Systematized Delusional Insanity.

Non-systematized delusional insanity is a mental state in which there is absence of either depression or exaltation, except such as would be reasonable were the ideas present not delusions. The patient's conduct is controlled by one or several delusions. The exaltation or depression is not out of proportion to the assigned cause, as is the case with melancholia and mania. There is no limit to the variety of delusions, but they usually fall into one of the following groups: Grandeur and pride, unseen agency, persecution and suspicion and identity. The patient may be very excited in bouts or quiet throughout according to the type of delusion present. This type of insanity is nearly always secondary to mania, melancholia or some chronic intoxication such as alcohol and drugs. The mental enfeeblement is variable, but the majority of patients manifest considerable dementia.

Systematized Delusional Insanity.

Systematized delusional insanity is an insanity which usually has an insidious onset early in life and gradually develops until some action on the part of the individual brings him into conflict with authority. The mental condition is a mixture of suspicion and egoism. The other name for the condition is paranoia which is comprehensive enough to those who are familiar with the mental state it designates, although totally unintelligible from an etymological point of view. The disease is progressive and is systematized and unrestricted to any limited sphere. The patient usually has a definite delusion concerning certain objects and persons. Other persons and objects become gradually associated with the original delusion in the mind of the patient, while the delusional idea becomes elaborated indefinitely. These patients are liable to take the matter of retaliation into their own hands and commit violence. In other matters their conduct may be quite regular, hence the danger of their remaining uncertified until some tragedy

takes place. They are of a very litigious disposition and live in the atmosphere of their grievances, to the detriment of their general health and behaviour. Physically these patients are unhealthy in appearance and usually suffer from some physical disease of which they do not complain, while loud in their complaints against their persecutors. The brain convolutions usually manifest abnormality of pattern.

Dementia Præcox.

Dementia præcox or primary dementia is a mental disease usually commencing during adolescence up to which time the patient is as a rule of good intelligence, sometimes above the average. Autopsies in these cases reveal a fine fibrosis of liver and kidneys indicating a chronic intoxication and when the dementia is firmly established, wasting of the brain with compensatory changes in the ventricles are present. Sir Frederick Mott considers that the condition is a primary neuronic decay with atrophy of the generative glands. The clinical picture may be hebephrenic (the mental condition of youth) paranoidal (with suspicions like paranoia) or catatonic in which the patient does things in blind obedience to abnormal stimuli from within. Attempts are continually being made by psychiatrists to describe additional types of this disease. There is a wide range of symptoms: paralysis of emotion, delusions, hallucinations, negativism, catalepsy, stereotypy, mannerisms and mischievous behaviour being the chief. There is no real exaltation or depression as the emotion is paralysed, although kittenish behaviour and stuporose periods sometimes simulate them. The mental and physical condition progressively deteriorates. The psycho-analytical school on the continent of Europe have introduced a term schizophrenia or "splitting of the mind" in connexion with this variety of insanity. In connexion with primary dementia as a mental disease it is interesting to point out that this type of insanity appears to be on the increase while mania and melancholia are diminishing. Eighteen years ago the older attendants in the State mental hospitals used to remark this change of type in the patients who were being received. In 1908 statistics were taken and on comparison with statistics taken in 1921 the following was noticed:

- (i.) That the primary dementia cases have jumped from 3.8% in 1908 to 16% in 1921.
- (ii.) That the cases of mania have dropped from 5.4% in 1908 to 2.3% in 1921.
- (iii.) That the cases of melancholia have dropped from 5.1% in 1908 to 2.4% in 1921.
- (iv.) The general paralysis of the insane and grosser brain lesions are about the same for 1908 and 1921.
- (v.) That the percentage of epileptic patients among the "idiot cottages" has dropped slightly in 1921 from what it was in 1908, being 22% in 1908 and 21% in 1921.

- (vi.) That the percentage of epileptics among those suffering from acquired insanity has dropped from 5.6% in 1908 to 5% in 1921.

This shows that there were four times the percentage of persons suffering from primary dementia in 1921 as in 1908 and that the number of those with mania and melancholia are respectively about half of what they were in 1908. This might be said to be due to diagnosis, as although Morel described primary dementia in 1860, it was not till the first year or two of the twentieth century that Kraepelin's work was instrumental in bringing it under the notice of the English psychiatrists. Against this is the evidence of the attendants who did not worry about the diagnosis, but about the scarcity of working patients, because primary dementals are not much use as workers. The apparent increase of primary dementia and decrease of mania and melancholia are worthy of a careful scrutiny.

Alternating Insanity.

Alternating insanity or *folie circulaire* is a mental disease in which periods of mania, normality and melancholia succeed each other at varying periods of time and with varying degrees of intensity. It seems to have a predilection for the educated classes. It is very chronic. As the majority of the patients live a long while, the pathology of this condition is confused with senile changes. One change that seems to stand out above the others is the massive thickening of the inner table of the calvarium which is present in a majority of the instances examined.

Dementia (Senile, Secondary or Terminal).

In the senile variety of dementia the changes of old age with defective excretion react upon vulnerable brain tissue already in the process of normal degeneration and the clinical picture becomes a morbid exaggeration of normal presbyphrenia. This senile dementia is distinct from senile melancholia or mania coming on in old age. Senile mania and senile melancholia present the picture of that particular change in affect in a person of sixty years and over, while senile dementia presents a picture of mental weakness in every sphere. The most common symptoms in senile dementia are loss of memory (especially for recent events, the patient living in his past) falsification of memory, delusions of having been defrauded of real or personal estate, nocturnal restlessness, stupor and terminal euthanasia. In secondary or terminal dementia the degrees of feeble-mindedness vary considerably. The dementia following mania is more intense than that following melancholia. The patients suffering from secondary dementia make up the majority of the trusted working patients in an institution which is the only suitable home for them. A blunting of all intellectual and inhibitory forces with retention of the primary and organic impulses is the usual picture of the secondary dement. The destruction of cells which have reached full growth and have functioned, will always leave traces of the fact that reactions of higher type have taken place. In this

way dementia can be distinguished from amentia where function has never taken place and furthermore, traces of former habits will distinguish the educated dement from the dement whose mode of life was not so refined. The dement has been aptly described as "the mast sticking up where the ship has gone down."

Volitional Insanity (Impulse, Obsession, Doubt).

Killing, stealing and destruction of an enemy's property are instincts handed down from the cave dwelling ancestors of present day man. These were necessary to insure personal safety in those times before the Crown arranged for policemen to protect person and property. Under certain conditions, these dormant impulses come to light in the form of homicide, kleptomania and pyromania. Sometimes the sexual instinct is affected and nymphomania and satyriasis are the result. A normal impulse with a weak will power or loss of inhibition (called aboulia) or a very strong impulse with a normal inhibition may result in the impulsive act. The conditions of imperative ideas and obsessions, phobias and doubt are closely associated with psychasthenia. The patient may be quite aware of the abnormality of his desires, but finds that any attempt at control produces an unpleasant sensation. Giving in to the craving produces temporary relief which is followed by a dissatisfaction at having been conquered. Included in this variety are the various phobias which often commence in neurasthenia and which at one time the patient could control, albeit with some degree of painful effort. Impulses may occur periodically, especially in females at the menstrual period. Mark Twain in the "Innocents Abroad" describes how a certain jingle followed him through all the business of the day interrupting his thoughts in the following words and thoroughly getting on his nerves.

Punch my brother, punch with care,
Punch in the presence of the passenger
A pink trip slip for a ten cent fare

and so on. The varieties of this type of insanity are very numerous and treatment depends mainly upon accompanying circumstances and conditions.

Moral Insanity.

There are individuals with a complete or partial incapacity for moral education. There is a constitutional inferiority present. They have no moral sense, no remorse, no love of good and no response to punishment. Unlike the imbeciles, who get into mischief through lack of self-control accompanying congenital mental deficiency and who have "a policeman at the elbow" type of conscience, the morally insane have often a love and impulse to do things evil. Certain American authorities say that this constitutional inferiority is of more importance than intellectual defect in the production of criminals.

Insanity Due to Epilepsy.

Long continued epilepsy frequently produces insanity which gradually drifts on to dementia. Epileptics may have mental outbursts in place of a

fit. These outbursts of intense excitement are called *epilepsia larvata* or masked epilepsy. The usual clinical picture of epileptic insanity is periodical seizures or fits preceded or followed by mental excitement or stupor, while the interim is a state of mild or severe dementia. The peculiar characteristics of the epileptic insane during the quiet periods are impulsiveness, irritability, hypochondriasis, constant importuning for some object, gluttony and querulousness. It is said that there is no neurological symptom which cannot be found in epilepsy during a bout of seizures. Epileptic attacks occur in congenital insanity and in acquired insanity with epilepsy. The juvenile type of general paralysis of the insane is frequently incorrectly diagnosed as epilepsy, owing to the epileptiform attacks in the former occurring about the age at which epilepsy commences. In the juvenile general paralysis of the insane, however, the onset of mental deterioration and bodily weakness is much more rapid than in epilepsy. The pathology of epilepsy is that of a chronic irritative toxin, producing fibrosis of the liver, kidneys and spleen, thickening of such structures as endocardium and proliferation of the connective tissue of the brain producing a gliosis. The *cornu Ammonis* is sclerosed to a remarkable degree in some of the cases of epilepsy. Those epileptics who are congenitally syphilitic and yield a reaction on having their blood tested, manifest the same pathological findings as are seen in those cases in which the proof of syphilis by history and blood test is not forthcoming.

General Paralysis of the Insane.

General paralysis of the insane is a quaternary form of syphilis affecting the central nervous system from the brain downwards, while *tabes dorsalis* affects it from the spine upwards. When the symptoms combine, the term taboparesis is given to the resultant group of symptoms. Jean Lepine, of the University of Lyon, who examined French native black troops, Warnock at Cairo and McLaren of Korea, state that the immunity of the native races from the parasymphilitic complications of syphilis is well known, most striking, because among native races syphilis is very prevalent and sometimes very malignant. This immunity disappears from the moment the populations adopt European life, lose their primitive calm and overtax their brains, therefore the Krafft Ebing formula for the aetiology of general paralysis of the insane, "civilization and syphilization," appears correct. Progressive mental degeneration and physical weakness result. As there are several types of the disease, it is imperative not to diagnose general paralysis of the insane on mental symptoms alone. The mental symptoms most commonly met with are megalomania, mental enfeeblement and perversion of instincts. The general paralytic loses his intellect in the reverse order from that in which he acquired it, passing through the stages of adolescence, boyhood and infancy, exhibiting such instincts as are peculiar to each age, for example, the collecting habit of the boy and the destructive habit of the child. The physical signs are Argyl Robertson pupil, dysar-

thria, muscular tremors, especially of the tongue and facial muscles (the so-called trombone action of the tongue being very characteristic), alteration of kneejerks, being *plus* or *minus* according to the condition being general paralysis of the insane or taboparesis, apoplectic, epileptiform and apoplectiform seizures, alteration in gait, incoordination of muscles and Romberg's sign. The mental symptoms of the juvenile type which frequently commence at the age of puberty, are the same as those of the adult, but owing to the make up of the child's mind the megalomania is expressed in a childish manner. In both types the blood and cerebro-spinal fluid yield a response to the biochemical test for syphilis. The macroscopical *post mortem* findings are thickening of the dura and the piaarachnoid, the latter being attached to the cerebral cortex by a thickening of the perivascular sheath of the vessels entering the cortex, so that on stripping of the membranes the superficial layer of the cortex is "nibbled" or torn off at the summits of the convolutions. The whole brain is shrunken and hardened by a general gliosis which is seen especially in the subependymal lining of the ventricles, particularly in the fourth ventricle. The sectional slices of the brain are cupped and the colour of the cortex reddish grey. The microscopical changes are absence of cells in the superficial layer of the cortex due to achromatolysis, increase of glial cells, destruction of nerve fibres in the superficial layers, thickening and infiltration of the membranes, perivascular infiltration and formation of new cortical vessels. Plasma cells cover the vessel walls inside the perivascular sheath and endothelial cell proliferation is prominent where there is active destruction going on. There is a pleio-cytosis in the cerebro-spinal fluid with an excess of globulin.

Organic Insanity with the Grosser Lesions.

Lesions, tumours *et cetera* of the prefrontal lobes will affect the mental state of individuals who have no inherited vulnerability, because the area affected controls the higher mental attributes. Lesions, tumours *et cetera* of any parts of the brain in persons with a psychopathic inheritance will produce mental symptoms. Tumours, softenings, hæmorrhages, emboli and thromboses are the grosser lesions most frequently seen. Some of these gross organic conditions cause increased intracranial pressure symptoms and some do not. In chronic, slow growing tumours there may be no symptoms of the intracranial pressure being raised. Some cause fits and some do not. There is an extraordinary incongruity of physical and mental symptoms and of the *post mortem* findings in the case of tumours of the brain found in the insane. Recently an elderly patient suffering from dementia and having a paresis of the arm which was reported by the friends to have been the result of a stroke some years ago, was found *post mortem* to have a large tumour of the dura pressing down upon the trunk and leg centre. The mental symptoms vary widely, as do the physical symptoms in insanity with the grosser brain lesions and tumours. There is always more or less mental enfeeblement present with

physical disablement due to the central lesion. Nothing more definite can be said in a brief account such as this must necessarily be. The mental symptoms vary according to the age of the patient. In senile cases the characteristics of senile insanity are grafted on to the mental symptoms due to the lesion. In addition to the symptoms produced by gross changes of an arteriopathic nature there are also symptoms caused by the general alteration of the blood supply dependent upon the changes in the vessels.

Confusional Psychosis (Exhaustion Psychosis).

Confusional psychosis (exhaustion psychosis) is associated with definite, manifest, physical illness as the outstanding feature. The mental condition approaches stupor with bewilderment. Perception, orientation and memory are affected. There are several types described, some of which are difficult to distinguish from *dementia præcox*. A good deal of confusion has been caused in the study of *dementia præcox* and this disease owing to the similarity of some of the symptoms of one type of this disease to the former. Those with acute and intense symptoms generally have a bad prognosis. The *post mortem* changes in the acute intense cases indicate a long standing toxæmia in addition to the signs of intense acute intoxication. Two members of the same family of different sexes and different ages died from this acute variety of confusional insanity within a year of each other and both had the same *post mortem* changes of chronic and recent intoxication in addition to a simplicity of brain pattern which is seen in families affected by the psychopathic dyscrasia.

Korsakow's Syndrome: Alcoholic Psychosis.

The ingestion of alcohol, plus some other factor not yet determined, may produce peripheral neuritis, mental symptoms alone or mental symptoms and peripheral neuritis combined. The majority of the patients are female. The physical signs of peripheral neuritis are as in the sane. The chief mental symptoms are falsification of memory, general mental enfeeblement and hallucinations. An extraordinarily frequent delusion is that the patient has a baby in the bed with her. If the patient die in the early stage of the disease the brain is biscuit colour and greasy to feel and the convolutions are flattened as if under pressure. Fatty changes are found in the other organs and in the affected nerves of the legs.

Other Varieties Named After the Exciting Cause.

Mitral Stenosis.—When the degree of mitral stenosis is severe, the mental symptoms have a constancy worth recording. The stenosis of the mitral opening in the cases examined was sufficient to admit the tip of the little finger. The majority of the patients were women in the early 'forties. The outstanding feature was the intervals of mental lucidity and confusion alternating within a few minutes of each other. Periodical excitement, partial delirium, incoherence, impulsiveness and mental confusion also occur. The usual changes in

the lungs and the liver of this cardiac disease are found *post mortem* with no peculiarity of change in the brain.

Tuberculosis.—Tuberculosis usually produces confusional insanity with delusions of suspicion. Sometimes the "*spes phthisica*" is present, but this does not occur with the frequency that exists in the sane patient.

Syphilis.—During the secondary stage of syphilis syphilitic mania may occur. Tertiary syphilis is common in the delusional insanities and quaternary syphilis is the cause of general paralysis of the insane, tabo-paresis and the terminal delirious insanity of locomotor insanity. A patient was received at Yarra Bend while he was attending the Melbourne Hospital for early secondary syphilis. Fourteen years afterwards while still a patient at the Yarra Bend Hospital he developed general paralysis of the insane and died there.

Alcohol.—*Mania à potu* is a condition which comes on suddenly during a carousal. It usually lasts only a few hours. Chronic alcoholism may produce *delirium tremens*, Korsakow's syndrome or chronic delusional insanity. Periodic drinking bouts with acute excitement and irresponsible conduct followed by periods of total abstinence characterize dipsomania which is an impulsive insanity.

Chorea.—In the more severe cases of chorea, delirious symptoms may occur. In the hereditary or Huntingdon's chorea which occurs in certain families at about the age of thirty years, there is progressive dementia with melancholia. The choreic movements persist until the end. The *post mortem* examination reveals a chronic encephalo-meningitis.

Masturbational Insanity.—Masturbational insanity is a name sometimes given to a form of insanity by practitioners who have not had experience in hospitals for the insane. Medical men in these institutions recognize that it is a symptom and not a cause of the mental disease, although its effect upon the patient aggravates the mental symptoms. Masturbation is the self gratification of a pleasurable sensation when the æsthetic controlling neurones are impaired or lost or where local changes, such as the residual urine of an enlarged prostate in the aged, act as an unnatural stimulation.

Uterine and Ovarian Insanity.—Uterine and ovarian insanity are really insanities in which disorders of these organs act as the exciting cause.

Hysterical Insanity.—Hysterical insanity is the name used for an insanity the chief characteristic of which is ostentation, sexual behaviour and loss of emotional control. The name embodies the old idea of the association of uterine disturbances with hysterical conduct and was probably suggested by the erotic conduct of the patient.

Puerperal Insanity.—Puerperal insanity may occur from the birth of the child till six weeks after the confinement. It is the outcome of the stress of the confinement in a predisposed individual. The symptoms are usually those of confusional insanity. Suicide, homicide, erotic display, indifference to the

welfare of the child and an unhealthy appearance are the most striking features of this insanity. *Post mortem* examinations made on patients dying from this insanity have been made at all stages and the uterine conditions have not appeared different from those of confinement in the sane.

Lactational Insanity.—Lactational insanity is due to the exhaustion of suckling the child when the neurones of the mother are vulnerable. As would be expected from the nature of the stress, the mental symptoms are those of melancholia and the patient looks physically debilitated.

Insanity of Pregnancy.—Insanity of pregnancy is an infrequent type of insanity and occurs mostly in women pregnant when advanced in life. This type is usually melancholic.

Climacteric Insanity.—In common with other critical periods in life the climacteric exercises a considerable stress upon the central nervous system. There are all kinds of vasomotor disturbances and a general feeling of depression and inability to cope with the ordinary efforts of life. A confusional melancholia is the usual type of insanity and the prognosis is not good.

Miscellaneous.—There are many other varieties such as diabetic insanity, post operative insanity, post connubial insanity and others which are named after the stress which precipitates the insanity. They do not justify a special description as the mental symptoms are not constant.

THE DIAGNOSIS AND MANAGEMENT OF PERSISTENT OCCIPITO-POSTERIOR PRESENTATIONS.¹

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DURING 1924 at the Royal Hospital for Women there were 1,595 deliveries within the hospital. Out of this number in twenty-five instances there was a persistent occipito-posterior presentation. Interference and forceps extraction became necessary for twenty-two of the patients.

In hospital practice it is common to find that these cases are not diagnosed before admission. The patients may be sent in on account of an alleged pelvic deformity for which Caesarean section is urgently required. On admission, however, careful examination fails to disclose any abnormality of the pelvis or overdevelopment of the fetus. It occurred to me that some notes on this tedious complication of labour might be interesting to you and would introduce a subject for profitable discussion at your annual meeting.

Cause.

When the head engages with the occiput posterior, malrotation into the hollow of the sacrum will occur

in about 5% of cases. The factors which control this short rotation through one-eighth of a circle to the back are as follow:

1. The child's back lies upon the convexity of the mother's spine about the sacral promontory. Where the anterior abdominal wall is firm, as in *primigravida*, the backward pressure upon the uterus tends to straighten out the foetal spine and cause slight extension of the head.

2. When the occiput lies to the back of the pelvis in one oblique diameter, the biparietal diameter of the head lies posterior to the other oblique diameter. During uterine contraction the largest part of the head is then crowded into the posterior part of the pelvis where there is little room for it, whereas the sinciput lies more or less free and encounters very little resistance from the smooth antero-lateral pelvic wall. As a result the extended attitude of the head is accentuated.

3. Where the pelvic floor has been weakened as from injuries during previous labours or when the uterine contractions are imperfect and weak, the foetal head does not meet with the normal amount of resistance from the pelvic diaphragm. In this way the slightly extended attitude of the head remains unchanged.

The final result of this incomplete flexion is that a part of the head in front of the bregma becomes the leading part and following the rule of all mechanisms is rotated to the front. The occiput then comes to lie in the hollow of the sacrum.

In order that the head may be born the occipito-frontal diameter of the head with a length of eleven and a half centimetres (four and a half inches) and a circumference of thirty-five centimetres (thirteen and three-quarter inches) has to pass through the outlet instead of the normal sub-occipito bregmatic measuring nine and a half centimetres (three and three-quarter inches) in diameter and twenty-eight centimetres (eleven inches) in circumference.

Labour is inevitably prolonged under these circumstances and it is an unusual perineum that does not rupture and rupture badly under the excessive strain put upon it. The child is likely to suffer from the prolonged pressure and may be born dead.

Diagnosis.

The importance of recognizing occipito-posterior positions before the onset of labour cannot be overestimated. By the methods now adopted in the prematernity clinic correct diagnosis of position should be made after the thirty-sixth week. By abdominal palpation it is possible to make an accurate diagnosis in time to correct malpositions, if the obstetrician will but keep a close enough watch in the antenatal period.

In occipito-posterior positions the breech is felt to occupy the fundus. Foetal limbs can be palpated in the front of the uterus about the umbilicus. To demonstrate the back it is necessary to push the ulnar border of the examining hand well back into

¹ Read at the Annual Meeting of the Central Southern Medical Association, New South Wales, on February 20, 1925.

the loin, at the same time pressing the uterine contents into this loin by the other hand from the opposite side of the uterus; in this way the back can be traced down to its termination at the anterior shoulder. This landmark in posterior positions will be found to lie at a point more than seven and a half centimetres (three inches) from the middle line in either iliac fossa.

Turning now to face the patient's feet, the points of the fingers of each hand can be pressed down into the pelvic brim from above each inguinal ligament, so as to make out the contour of the fetal head. In the right occipito-posterior position the sinciput is easily felt above the pelvic brim near the left ilio-pectineal eminence and usually at a higher level than the occiput, which lies more deeply in the right side of the pelvis. In the left occipito-posterior position *mutatis mutandis* the sinciput is to the right in front and the occiput deeply placed to the left. When these two points of the head are palpated, it can be ascertained whether the head is movable or whether it is fixed in the brim.

The fetal heart sounds are usually heard at their maximum above and lateral to the anterior shoulder; frequently in this position a loud uterine souffle may interfere with the clearness of the sounds. When the fetal spine has become slightly extended where it lies over the convexity of the lower lumbar and upper sacral vertebrae of the mother, the fetal chest is necessarily pushed forwards and comes to lie close to the surface in the hypogastrium. In such conditions the sounds will also be heard distinctly near the middle line or even across it in the opposite iliac fossa. This sometimes leads to a wrong diagnosis.

A pelvic examination before labour has commenced will confirm the conclusions arrived at by abdominal palpation. The head is usually very high up, but the relation of its sagittal diameter to one or other oblique can be demonstrated. At the same time a test can be made for any disproportion between head and pelvis.

I have hitherto been describing the diagnosis of a posterior position before labour has begun. I now come to the diagnosis of posterior positions during the course of labour. When the uterine walls are in a state of contraction, it is a more difficult matter to be sure of the position by abdominal palpation alone, especially if the patient has a fat abdominal wall.

By examining between the pains, however, it is usually possible to demonstrate the fetal parts by the same manœuvres. The most important landmark of the fetus is the anterior shoulder. If this is watched carefully during the first stage of labour, its behaviour will enable us to estimate the progress of the fetal head without making a vaginal examination. As I mentioned above, before labour starts the anterior shoulder in posterior positions is found more than seven and a half centimetres (three inches) from the middle line. Before engagement of the head it will lie on a horizontal plane seven and a half to ten centimetres (three to four inches) above the *symphysis pubis*. When the

head is fully engaged, the anterior shoulder will be found on a horizontal plane five centimetres (two inches) above the *symphysis pubis*.⁽¹⁾

As the head descends and begins to rotate either forwards or backwards, the anterior shoulder similarly will rotate forwards or backwards, as the case may be. If the normal long rotation is taking place, the anterior shoulder will become more and more prominent as it comes forwards and descends towards the symphysis. Where the short rotation occurs, the anterior shoulder will disappear into the corresponding iliac fossa as the shoulders come to occupy the transverse of the inlet.

If the anterior shoulder is indefinite or tends to disappear outwards, a vaginal examination then becomes necessary. The fontanelles and sutures can be felt through the os as it dilates unless head moulding or a large *caput* has obliterated them. In posterior positions the distinguishing feature is the ease with which the anterior fontanelle comes within touch in front and the difficulty of reaching the posterior fontanelle far back on either side of the pelvis. If the fontanelles and sutures are confused by head moulding, the fingers should be passed up by the side of the head to touch the ear. By feeling the pinna a correct diagnosis can be made in all cases.

Treatment.

The advantage of recognition of posterior positions before labour has started is that prophylactic treatment can be employed. Before the head is fully engaged, by using Buist's method, the fetus can be rotated into an anterior position. This method has been made use of with success in the Prematernity Department of the Royal Hospital for Women.⁽²⁾ Buist describes the method as follows:

A binder is laid upon the patient and two towel pads are prepared. The first is rolled to about the thickness of a forearm, the second is folded to a flat pad six or seven inches square. The rolled pad is pinned to the binder in such a position that when the binder is firmly secured, the pad will lie close in front of the anterior superior iliac spine behind and parallel to the trunk. The flat pad is pinned so as to lie on the limbs, pressing them backwards. It is sometimes useful to roll the patient to the side opposite the trunk and by hand bring the trunk as far as may be over to that side. The binder is then pulled firmly home.

When a posterior position is recognized only after the onset of labour, it is not always necessary to interfere. As long as the head is lying in the oblique diameter and descent is going on, it is advisable to wait, provided that the condition of mother and fetus is good. The woman should lie on the side to which the occiput points. This has the effect of dragging the breech further over to the same side. The fetal spine is thus straightened and the occiput forced down. Flexion is increased and the rotation of the occiput to the front is encouraged.

If, however, descent stops or particularly if the occiput has actually rotated backwards, something must be done. There are four ways of dealing with this complication.

(1) In *multiparæ* manual flexion of the head may be tried by pushing up the sinciput during a pain.

This method is seldom effective in face of the disabilities which have caused descent to stop.

(2) When dilatation is complete, the head should be rotated by the whole hand in the vagina. The patient is anaesthetized and placed in the left lateral position and the right knee supported. If the occiput lies to the right, the left hand should be introduced into the vagina, the extended fingers passing upwards beyond the head to control the anterior shoulder and to bring it forward along with the occiput. When the occiput is to the left, the right hand should be introduced.

Before the manœuvre is started the head must be pushed up to disengage it slightly. It is necessary to press on the fundus at first after correction to prevent the head rotating back again. In *multi-paræ* this may be all the interference that is necessary, provided the pains are strong. In most cases, however, it is best to apply forceps and deliver once the head is in the corrected position.

(3) The third method is rotation by forceps. The instruments are applied to the head in the posterior position with the patient fully anaesthetized. The head is disengaged by gently pushing up the handles of the forceps. The malposition is corrected by rotating them in a wide sweep, care being taken to exercise the minimum of force in the manipulation. The occiput should be brought a little beyond the middle line. Pressure on the fundus will keep the head in the anterior position while the forceps are removed and reapplied correctly. This manipulation is a most satisfactory one in expert hands, provided the operator always remembers to handle the tissues gently.

(4) The fourth method, namely, craniotomy, need only be mentioned. With an unusually large head it may be found impossible to effect delivery without an unjustifiable amount of force. This is most likely to occur in a pelvis of which the outlet is contracted. It is conceivable that in such a case craniotomy may become necessary. Such a degree of deformity, however, necessitating such drastic treatment should be noticed in the course of an antenatal examination and timely measures taken to prepare the patient for Cæsarean section.

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THE USE OF HYDROCHLORIC ACID AND SODIUM BICARBONATE IN THE TREATMENT OF CERTAIN COMMON DYSPEPSIAS.

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In the treatment of various dyspepsias every physician has experienced instances of apparently contradictory effects of the administration of acid and alkali. When sodium bicarbonate is adminis-

tered, it commonly raises gastric acidity and in subacid dyspepsias it is just as efficient in its action as hydrochloric acid, though sodium chloride may be used in place of either. In achlorhydria sodium bicarbonate is very variable in its action; in some patients it affords rapid relief, while in others it has no effect or produces increased discomfort. Some of these anomalies find a ready explanation from the results of recent work in this department on the physiology and pathology of gastric function; to make myself clear, it will be necessary to give an outline of some of this work. I shall, however, omit many of those points of chemical and other detail which would be necessary in a strictly scientific dissertation.

It has been abundantly shown by Boldyreff,⁽¹⁾ Bolton and Goodhart,⁽²⁾ Ryle⁽³⁾, myself⁽⁴⁾ and others that the acidity of the gastric contents is regulated almost entirely by the amount of duodenal fluids regurgitated into the stomach during the digestive period, but it has been almost universally assumed that this regurgitation is controlled by the pyloric sphincter. In 1924, however, I was able to show that the forces controlling regurgitation were situated in the jejunum.⁽⁵⁾ This paper supported the suggestion of Alvarez⁽⁶⁾ that practically all dyspepsias can be divided into two main classes:

- (a) Those in which the reflux of duodenal fluids is defective, the hyperchlorhydric and duodenal ulcer type and
- (b) Those in which the reflux is excessive, the hypochlorhydric, eructative and flatulent type.

It is probably some defect in the accommodation of gastric tonus to the excessive or defective regurgitation of volumes of fluid into the stomach that is the immediate cause of many of the symptoms of dyspepsia.

The next matter to engage my attention was an inquiry into the nature and biological meaning of this reflux and its bearing on the mechanism of the pylorus. The subject of this paper was one of the results of this investigation.

The Nature of the Reflux Force.

Experiments were made on normal students and on dyspeptics, in some of the latter both before and after gastric operations.

On different days fairly close together the following test meals were given to each of four healthy students, but in a different order to each man in order to eliminate any psychic factors attending the first experience with the Rehfuß tube. The whole was carried out exactly as in the ordinary fractional test meal. In each fraction and in the fasting contents there were estimated (i.) the total acidity, (ii.) free acidity, (iii.) total chlorides. The different meals used consisted of (i.) an ordinary salt-free meal of thin gruel, four hundred cubic centimetres in volume; (ii.) the same gruel with amounts of hydrochloric acid varying in different cases to make

up a strength of from 30° to 80° of acid ($100^\circ = \frac{n}{10}$ = approximately 0.4% HCl). (iii.) As in (i.) with

sodium bicarbonate sufficient to make strengths of from 58° to 116° in different cases. (iv.) As in (i.) with sodium chloride of strengths of from 57° to 170° in different cases.

Gorham's⁽⁷⁾ objections that the fractions are not fair samples of gastric contents, since the latter is not a uniform mixture, were overcome by mixing the gastric contents before withdrawal by working the piston of the withdrawing syringe back and forth a number of times before a sample was drawn.

Lanz,⁽⁸⁾ Haneborg⁽⁹⁾ and Norgaard⁽¹⁰⁾ have disposed of the objections to titration provided the samples are poor in protein. These conditions were fulfilled.

When the results were plotted, the following were among the findings:

- (1) That each man in each of the above experiments brought his total chloride curve up to a certain definite point before emptying occurred or where the salt or acid added was initially above this point, the curve of total chlorides fell to this fixed point. I have called this point the "chloride point."
- (2) That even if various operations be made on the stomach, no matter what is done short of a total gastrectomy, the same law still holds good. Thus I have examined by this method a patient after each of the following successive operations were performed on him: (a) Gastro-enterostomy, (b) gastro-enterostomy undone and parts restored to normal, (c) soon after a hemi-gastrectomy (d) some weeks after the hemi-gastrectomy.

In all these examinations it was found that emptying did not occur till the chloride point of 120° was reached. Through the courtesy of Dr. H. B. Devine I have been able to examine a number of his patients and have found the same law to hold in all.

- (3) That each individual has his own "chloride point"; the lowest found was about 80°, the highest 130°, but the usual value is about 100°, that is roughly one-tenth normal solution or about the same as the chloride strength of plasma, a point of some significance as I have since found.
- (4) That the stomach will not be emptied till the "chloride point" is reached.
- (5) That the stomach of those individuals with a low "chloride point" will be emptied rapidly and the stomach of those with a high point will be emptied slowly.
- (6) That the fasting contents have always a total chloride strength equal to the "chloride point" for that individual, that is when the gastro-intestinal tract is at rest and in equilibrium with its contents, the latter have about the same salt strength as the plasma. The stomach and intestinal cells are therefore bathed with a fluid about iso-

tonic with blood and when these fluids are absorbed, the blood does not lose in chloride strength.

- (7) That if the inorganic salt strength of the gastric contents is augmented by the addition of sodium chloride to the food, the acidity rises to a higher level than normally and the emptying time is diminished. With sodium bicarbonate the same is found, with the exception that all free acid is neutralized during the first half to three-quarters of an hour, followed however, by a rapid rise to a level above normal in the majority of cases.

Interpretation of the Above Facts.

It appears from the above facts that one of the main functions of the stomach is to bring the food contents up to a certain salt strength or osmotic pressure which will be acceptable to the intestine.

Now the osmotic pressure of blood, made up almost wholly of all the salts in blood, varies from Δ 0.54° to Δ 0.60° which is isotonic with a solution of sodium chloride of strength 0.87% to 0.96% or 150° to 164°, the usual figure being about 154°. Of this total, the sodium chloride in blood accounts for about 100°. The intestinal contents, if intestinal rest or equilibrium is to be attained, must apparently be of the same value and this value is made up of the various salts secreted, that is the chlorides of sodium, potassium and calcium, the phosphates of sodium, potassium and magnesium, sodium carbonate *et cetera*. I have found that the proportion of chloride secreted depends largely on the value of that salt in the blood and it is probable that the same holds for other salts, so that we get a corresponding variation of the strengths of the salt constituents making up the intestinal osmotic pressure. My experiments show that sodium chloride accounts for 80° to 130° of the total salt strength of the gastro-jejunal contents, but although there is this wide variation among different people, for each individual it is, as was shown above, fairly constant. I have not thought it necessary to estimate the exact osmotic value of the fluids extracted from the stomach, but from what has been said, it will be seen that the varying chloride curve though on a lower level than one representing the true osmotic pressure of the contents, can be taken as a fair indication of the variations in the osmotic pressure of the gastric contents.

The above experiments show that if food of less than the required osmotic value or chloride strength enters the intestine lined with its delicate epithelium, it is promptly rejected into the stomach once more, with the result that the acidity falls and the inorganic chloride curve rises.

This is the biological meaning of duodenal regurgitation.

When, finally, the food reaches the required chloride or osmotic value, isotonic with blood, it can enter the intestine without stimulating its own rejection and the stomach is emptied.

It would also appear, firstly, that the lower the value required to be attained, that is the "chloride point," the sooner will this value be reached, with consequent rapid evacuation of the stomach. Secondly, that the less the difference between the "chloride point" and the salt strength of the food entering the intestine at any moment, the less will be the regurgitation and the regurgitative force. This is shown by the fact that in those cases in which salt was added to the food, whether sodium chloride or bicarbonate, the dilution of the gastric contents was less, as shown by the facts that the food residue in the samples formed a larger proportion in each sample than normally and that the acidity remained higher than normal.

J. L. Jona,⁽¹¹⁾ of Melbourne, who did some work along these lines in 1911, says: "It is generally admitted that one of the functions of the stomach is the establishment of osmotic equilibrium between the fluid food swallowed and the blood. This it does by adding salts, *et cetera*, to hypotonic fluids and by diluting the hypertonic. In the latter function the action of the stomach is aided by the salivary glands which pour out a copious secretion of saliva. . . . This function is no doubt protective, for the deleterious effects of exposing tissue cells to the action of hypertonic or hypotonic fluids is well known."

Origin of the Sodium Chloride Mostly Responsible for Producing Isotonicity in Fluid Foods.

It is obvious that part of the chlorides making up the "chloride point" value of the gastric contents is derived from the neutralization of gastric hydrochloric acid by pancreatic alkalis. But, as is well known, the duodenal fluids also contain preformed sodium chloride as well as other salts in strengths varying from 80° to 120°.

By means of a method of my own (which will be described at another time) I have been able to show that the sodium chloride values of the mixed duodenal fluids vary considerably in hospital patients and normal individuals. As an example, a recent examination of the chloride content of the bile from twenty-one persons collected after death revealed a variation of from 22° to 112°, with an average of 66°. My experiments show that these variations in alkali and sodium chloride values of the mixed duodenal fluids considerably modify the regurgitation of these fluids into the stomach and therefore gastric acidity, gastric volume and the rate of evacuation.

The Dyspepsias.

As the dyspepsias will form the subject of a further communication, only an outline of these aspects of the matter with which I am dealing, will be given here, enough to show the application of this work to the dyspeptic conditions.

It has been stated earlier that most dyspepsias can be divided into two main classes according to whether the reflux is defective or excessive. In the latter case the attainment of the required osmotic or salt value is apparently difficult with the result that rejection into the stomach continues long after

a meal. This is the regurgitative, bilious, eructative, flatulent type of dyspepsia. My experiments show that in these cases the chloride value of the mixed duodenal fluids is much lower than normal. There is probably also a low secretion of gastric acid, but this I have not been able to determine directly. These alterations again are probably connected with the fact that all these persons have a low blood chloride value. At any rate the attainment of the "chloride value" is retarded and the gastric volume does not diminish as it should. When in addition there is a lack of coordination of gastric tonus to gastric volume, symptoms are produced. The tonus of the gastric muscle normally increases during the gastric cycle. If, however, the volume of contents does not diminish at the same rate, an increased tension results which is felt by the patient as a "fullness." This of course, is only one of the ways in which this symptom may be produced, but I do not propose to discuss the various mechanisms of these here.

Our problem in this type of dyspepsia then is to increase the osmotic value of the gastric contents. This can be done in two ways: (a) By the administration of sodium bicarbonate, hydrochloric acid or sodium chloride. I have found that these substances diminish the regurgitation of duodenal fluids, hence the gastric acidity is raised and emptying is hastened with relief of symptoms. This accounts for the apparently curious facts, firstly, that the administration of acid or alkali may produce equally good results and secondly, that alkali after a preliminary neutralization of gastric acidity is generally followed by an even higher acidity than under normal conditions. It will also be obvious that in these cases it will be necessary to avoid giving these substances in too diluted a form, otherwise the trouble is untouched or even accentuated. Hence the form of administration of these drugs is a matter of the greatest importance. The usual dose of sodium bicarbonate, namely one gramme to thirty-three cubic centimetres of fluid (fifteen grains to one ounce) represents a strength of 400°. (b) The same result may be obtained by avoiding dilution of food, that is by giving dry food, rusks, toast and so forth and allowing fluids only between meals. These facts are familiar, but my experimental work makes the reasons therefor clear.

Turning now to the opposite type of dyspepsia, the hyperchlorhydric and duodenal ulcer types, we find that in all these cases there is a high blood chloride value, a high sodium chloride value of the duodenal fluids and there is reason to believe, a low alkali value also with the result that the "chloride point" or osmotic value is reached too early in the duodeno-jejunum. Apparently for this reason the jejunum ceases to regurgitate fluid. At any rate regurgitation ceases with the result that only a very low gastric inorganic chloride curve is present, but a high gastric acidity. These fit in with the facts familiar to radiologists that in these cases the emptying is rapid at first, then slow owing to a pyloric closure. Apparently the cessation of regurgitation leaves free acid in the first part of

the duodenum with consequent failure of the pylorus to open according to Cannon's law. If this view be correct, then the value of treating these cases by giving fluids in plenty (Warbasse⁽¹³⁾) is evident. It would also appear that if we are to give alkalis, they should be given either in dilute solution or in such quantity as to destroy all gastric acidity, so that no free acid could appear in the duodenum to produce pyloric closure with retention of food and later the sense of pain or fullness when the tonus of the gastric muscle rises.

Achlorhydria and the Use of Alkalis.

I have referred to the fact that the exhibition of sodium bicarbonate in some cases of achlorhydria with dyspepsia is followed by relief of pain and discomfort, but in others no such relief occurs.

In a previous paper in this journal⁽¹²⁾ I showed that achlorhydria is of two kinds:

(a) Pure achlorhydria or achylia, characterized by an absence of secretion of gastric juice and a low total chloride curve. This low curve is due to the reflux of duodenal fluids containing preformed sodium chloride into the stomach and the condition is found in and preceding pernicious anæmia, in most cases of *carcinoma gastrica* and in certain cases of dyspepsia. In the non-organic dyspepsias of this type the administration of sodium bicarbonate produces relief, at first sight a curious phenomenon, seeing that no acid is secreted.

(b) False achlorhydria, characterized by the secretion of gastric acid, but by its complete neutralization owing to excessive regurgitation of duodenal alkali. In this type the total chloride curve, made up of neutralized alkali and preformed sodium chloride from the intestine and glands, is high and rapidly reaches the "chloride point." The exhibition of alkali in these cases produces no relief and may result in increased discomfort.

The following table shows a few of these from my cases.

| Case. | Total Chloride at 1½ hours (normally about 100°). | Alkali relief. | Vomiting. |
|------------|---|----------------|-----------|
| F.S. . . . | 120° | 0 | 0 |
| M.H. . . . | 108° | 0 | 0 |
| E.A. . . . | 100° | 0 | + |
| 69 | 90° | 0 | 0 |
| W.B. . . . | 60° | + | + |
| E.E. . . . | 50° | + | + |
| A.N. . . . | 50° | + | + |
| D.P. . . . | 50° | + | + |
| K.H. . . . | 40° | + | 0 |
| H.A. . . . | 20° | + | 0 |
| J.A. . . . | 20° | + | + |

+ signifies the presence and 0 the absence of the symptom considered.

From this it will be seen: (i.) That those who have difficulty in reaching the "chloride point" or required salt strength, are eased of their discomfort, fullness or gastrointestinal unrest by alkalis. It seems probable that the cause of the trouble was this inability to reach the required salt value and that the sodium bicarbonate acts by increasing the salt strength of the gastric contents, so that regurgi-

tation ceases and gastrointestinal rest can follow. In most cases hydrochloric acid gives similar relief and probably for a similar reason. Probably almost any other salt would act as well. In many cases of achlorhydria the exhibition of hydrochloric acid is followed by pain or discomfort and vomiting. I do not possess sufficient data, however, to offer any definite explanation of this.

(ii.) That vomiting in these cases at any rate has no relation to the factors I have been discussing.

Conclusions.

(1) Before the intestine will accept chyme from the stomach, this chyme must be of a certain salt strength or osmotic value. Any value above or below this causes rejection by the intestine of the food back into the stomach, where it remains until such time as it has by the addition of secreted hydrochloric acid or of sodium chloride or by dilution obtained the correct salt strength. The stomach then empties.

(2) The value to which chyme must attain, is a constant for each individual, but varies in different individuals from 80° to 130° that is, about isotonic with sodium chloride in blood (100° equals one-tenth molar solution).

(3) When the strength of sodium chloride or acid in the various secretions is low, there is difficulty and delay in the attainment of the required salt value of the food. This results in increased and prolonged regurgitation of duodenal fluids, with in consequence lowered acidity and prolonged evacuation time.

(4) The administration of hydrochloric acid, sodium bicarbonate or chloride has the effect of raising the salt strength of the food more rapidly to its required value, with the result that regurgitation of duodenal fluids is diminished, acidity is raised and the stomach empties more rapidly. The accommodation of the volume of gastric contents to gastric tonus is thus more rapidly made with relief of symptoms.

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Reviews.

OPHTHALMOLOGY FOR THE PHYSICIAN.

"MEDICAL OPHTHALMOLOGY" requires little introduction, for it comes from a member of the Moorfields Hospital staff, Foster Moore.¹ The quality of the productions from this hospital is well known. This work is especially welcome, because it deals with a neglected field, the investigation of visual and ocular signs occurring in general medical diseases. It is a surprising neglect when we remember that ophthalmoscopy reveals under a moderate magnification blood-vessels which are subject to the lesions of vessels elsewhere. The blood vessels of the fundus are a guide especially to the state of the cerebral vessels. Diabetes, nephritis, arteriosclerosis and leucæmia affect them as elsewhere, but only in the fundus are the effects spread out to view under a magnifying lens. One also sees the cross-section of a cranial nerve and its flattened origin, the retina, together with the iris which is an annular plexus of vessels often affected by syphilis, tuberculosis, gonorrhœa, sympathetic lesions *et cetera*. The lens may be regarded as an index of the effects of diseases on epiblastic structures generally. The ease with which these structures can be examined makes the ophthalmoscope a valuable medical instrument and ophthalmology a valuable guide to diagnosis, prognosis and treatment.

The reader will be delighted with the sections devoted to arteriosclerosis, diabetes and nephritis. Much of the original work underlying these sections was done by the author himself. Other subjects treated thoroughly and well are papillœdema, cortical representation based on the work of Holmes and Lister and pituitary diseases. The last named section is mainly a summary of the researches of Cushing and Clifford Walker.

Though many of the defects of the first edition have been eliminated, there are still possible improvements. The order of subjects dealt with in the first chapter is confusing and the treatment in places not full. We would value a section devoted to the visual signs of cerebral tumours. No mention is made of conjugate deviation and little of the conjugate paralyses and the paralytic syndromes.

Perhaps the chief defect is the undue attention paid by the author to unique and very recent local cases and a corresponding neglect to look wider afield in space and time for information and experience. The ideas of continental authors do not get due consideration. An exceedingly rare case which had come under the notice

of the author during the six months prior to the publication of this book, is given a page and a half. In a book of this kind it deserves as many lines. A full page coloured illustration is devoted to it. As there are but eight of such plates we regret the omission of plates illustrating papillœdema, leucæmic retinitis, typical renal retinitis *et cetera*. The plate depicting *lipemia retinalis* is superb, but the colour photograph of blue-sclerotics is out of place in a book of this kind. The microphotographs are of great value. The binding and the paper are good and the printing excellent.

This is a book with which all physicians and ophthalmologists should be acquainted.

FRACTURES OF THE SKULL.

VOLUME VI. of *Annals of Roentgenology*, edited by James T. Case, is an attractively bound book with some sixty-four pages of letterpress on special art paper, together with forty-four full page plates. The book contains reproductions of one hundred and thirty-one skiagrams of the skull.¹

The introductory letterpress is somewhat terse and free from excessive padding, but is especially valuable in that attention is drawn to the great value of making a proper radiological examination in every case of head injury and likewise of every patient found unconscious from any uncertain cause. Just as an opaque meal examination has to a large extent replaced exploratory laparotomy, X ray examination of the urinary tract has limited the needs of exploratory nephrectomy and similar examinations of the chest have frequently done away with the necessity for exploratory paracentesis, so in the skull with efficient examination the plea of the school of surgeons who have hitherto insisted upon exploratory trephining in every case of head injury, is no longer justifiable at least before efficient X ray examination. As in other regions the indication is given by the skiagrams not only as to the necessity or otherwise of operation, but also as to the character and locality of any necessary procedures.

The author insists upon examination being made of both the lateral, anterior and occipital regions as well as the base of the skull. In describing the technique, complete immobility is rightly insisted upon, but it is regrettable that more stress is not laid upon the value of the Potter-Bucky diaphragm or similar instrument. Not one of the illustrations of the technique shows this instrument. However, the special value of stereoscopy which is usually not appreciated, is well emphasized. By this procedure alone can a proper interpretation of the relation of features to each other be properly determined.

Four plates are devoted to skiagrams of the normal skull, but these are disfigured by very clumsily inserted direction lines, frequently placed on both sides on corresponding parts of symmetrical views.

Stress is placed upon the occipital view which the author especially advocates, also on that of the base of the skull. The technique given of the latter is probably inferior to that described in this journal as the "gargoyle position," although a somewhat similar one is mentioned. The latter has been devised by Law and by this method the patient is examined in the upright position, an attitude impractical in unconscious patients.

Fractures of the vault are profusely illustrated by numerous skiagrams including a few of the occipital behind the *foramen magnum*, but it is noticeable that there is scarcely a single illustration of a fracture of the base of the skull. Probably these will be found more frequently with improved technique such as the adoption of the "gargoyle position."

The volume is a most important contribution to the study of fractures of the skull and should fill an important place in every medical library.

¹ "Medical Ophthalmology," by R. Foster Moore, O.B.E., M.A., B.Ch. (Cantab.), F.R.C.S.; Second Edition; 1925. London: J. & A. Churchill. Demy 8vo., pp. 344, with illustrations. Price: 18s. net.

¹ "Annals of Roentgenology: A Series of Monographic Atlases"; Edited by James T. Case, M.D.; Skull Fractures Roentgenologically Considered by William H. Stewart, M.D., with surgical comments by William H. Luckett, M.D.; Volume VI.; 1925. New York: Paul H. Hoeber, Incorporated. Demy 4to., 44 plates. Price: \$12.00 net.

The Medical Journal of Australia

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The Local Authority.

THE main difficulty in the administration of the public health laws based on decentralization is that of fixing the responsibility of the local authority. Experience in the past has taught that the measures prescribed for the safety of the community and for the attack on preventable infective disease fail because no two local authorities have the same definition of their obligations and no two local authorities exercise the same amount of energy, resourcefulness or prevision. The local health authority, being the municipal council, is essentially a political body. Its members are usually ignorant of the principles on which hygiene in its modern significance is based. The action required to combat disease is often unwelcome to the individuals concerned and the members of the local authority have to pander to popular favour. Not infrequently a local authority is asked to collaborate with a neighbouring local authority to strengthen an attack on a given disease even though there may be little obvious advantage to the residents of its own district. Compulsion has been tried, sometimes half-heartedly, sometimes injudiciously, but rarely successfully. Coercion has been more productive of good results, for example in connexion with the tuberculosis and venereal diseases schemes in Great Britain. But neither compulsion nor coercion will suffice as long as the local health authority is a political body and is free to interpret the rules of preventive medicine and hygiene.

The Royal Commissioners on Health have included in their report some details of a model scheme to be applied in the several States for the prevention of disease. According to this scheme the local health authority is to be a committee of representatives of adjoining municipal or political authorities combined to form a health district. Each health district is to have a whole-time medical officer

with a competent staff. It is suggested that one large municipality or two or more adjoining smaller municipalities should constitute the local health district. The Royal Commissioners mention that the medical officer of health would be responsible for the administration of all health activities. They do not specify to whom, but since he would be appointed by the district health committee with the approval of the Minister of Health, he would act for this committee. In other words he would be the expert adviser of the local authority and his duties, unless otherwise defined by a higher authority, would be prescribed by the committee. The higher authorities according to the scheme would be the Minister of Health of the State, the Director of Health of the State and the State Health Council. It must, however, be remembered that the scheme includes the elaboration of principles which should govern the administration of health laws and all action by the Commonwealth and State authorities in the prevention of disease. In addition it is proposed that there should be a Federal health council. Before the model scheme is accepted by the Branches of the British Medical Association in Australia, it is necessary for them to form a clear conception of the nature of the control that would govern the action of the local authority or district health committee and its expert medical officer of health. If we have interpreted the ideas of the Royal Commissioners correctly, the proposals may be summarized as follows. The Commonwealth Department of Health is to lay down general principles on health legislation and administration, that is the minimum requirements. The Federal Health Council is to serve as the official body whose chief object is the coordination of the actions taken by each State and by the Commonwealth. It is assumed that these actions would be in harmony with the general principles and minimum requirements. The State Health Council would be an expert advisory body whose recommendations would be submitted to the Minister of Health. The Minister and the Director of Health of the State would thus be the only higher authorities whose functions would include the control of administrative action by a district health committee. It appears to us that the scheme has been drawn with

considerable skill and perspicacity. It differs in certain respects from the scheme contained in the Hone-Newland report. The latter provides for a State Health Council representative of the services concerned with various branches of hygiene and a whole-time district medical officer of health. But it leaves the municipal district or shire council in the position of the local health authority. The scheme of the Royal Commissioners frees to some extent the local health authority from the political inhibition of the municipal councillors. It provides for a local administration by an expert medical officer of health who would be required to base his programme on the general principles and minimum activities laid down by the Commonwealth health authority. It relies to a considerable extent on the coercion of the local authority by the Federal and State authorities in the form of financial aid dependent on the proper conduct of its work. It invests the Minister and the Director of Health of the State with full control, but introduces ample machinery for an increased degree of uniformity of health legislation and of concerted action aiming at the prevention of disease. It makes for coordinate action in the interests of the people of Australia as a whole. Moreover it seems to us that the scheme built up on goodwill and full understanding of the common and the special problems of preventive medicine in Australia, is capable of being modified to suit unexpected developments more readily than any plan based on isolated administration.

Current Comment.

THE ACTIVITIES OF THE THYROID GLAND.

THE study of the function of an organ cannot be satisfactorily made apart from a study of its structure. Structure and function are largely interdependent; if either be altered a variation in the other generally becomes apparent. In dealing with pathological stages it is important to have in mind a clear conception of normal structure and function. This has been clearly shown by Dr. G. S. Williamson and Dr. I. H. Pearse in recent important studies on the thyroid gland.^{1,2} They point out that Marine and McCarrison carried the study of the pathology of goitre as far as it could go if the simple

"colloid follicle" was looked upon as the anatomical and physiological unit of the gland. In our issue of May 24, 1924, we discussed some aspects of Marine's work and his attempt to correlate physiological and clinical observation. His findings were based mainly on iodine storage and the results following the administration of iodine. Drs. Williamson and Pearse base their work on a study of the structure of the thyroid gland published first by them in 1923.³ This original communication is worthy of careful study. In their subsequent papers they refer to it at some length. They study the anatomy of the gland in great detail and recognize two cycles of function in the gland unit. They describe the parenchyma of the gland lobule as being divided by loose strands of fibroelastic tissue into a series of well defined functional areas or gland units. The fibroelastic tissue surrounding each gland unit carries intralobular blood and lymph vessels. These possess no muscle coat, they are formed of endothelium supported by fibrous tissue only. Perivascular lymph channels accompany the vessels and the loose fibroelastic tissue capsule of each gland unit is lined by a pavement epithelium. The serous cavity so formed is directly continuous with the intralobular lymphatic channels. This serous cavity is in fact a sinusoidal expansion of the lymphatic system. The lymphatic sinusoid is as characteristic of the thyroid as the portal blood sinusoid is of the liver. This comparison with the liver is of interest and is made repeatedly by these authors. The epithelium in the gland unit appears in long cylindrical columns. No point of attachment of the epithelium to the wall of the sinusoid has been noted. Dr. Williamson and Dr. Pearse conclude that the functional gland unit of the thyroid organ is essentially a lymphatic sinusoid in which float columns of epithelium enmeshed by a highly specialized plexus of blood capillaries. Epithelium of the thyroid is commonly held to be of two types, follicular, enclosing masses of colloid and forming the bulk of the normal organ, and non-follicular forming the so-called interfollicular tissue. Dr. Williamson and Dr. Pearse point out that there is some doubt about the identity and relation of each type of epithelium. The gland units of the thyroid contain epithelium columns which are entirely non-follicular, entirely follicular or both follicular and non-follicular. Further, each of these different appearances of the epithelium may be encountered within the limits of one gland unit. This and the alternation of follicular and non-follicular areas and the existence of areas manifesting all degrees of folliculation between the two extremes show that folliculation is a physiological and not an anatomical characteristic of the thyroid organ. Two distinct processes are apparent in the epithelium. One, vesiculation, results in the formation of colloid and the other is the active secretory process in which the whole gland unit takes part. Vesiculation is the predominant, though not the exclusive condition encountered in the average normal gland; it occurs in definite areas of the

¹ *The British Journal of Surgery*, January, 1926.

² *The Journal of Pathology and Bacteriology*, April, 1925.

³ *The Journal of Pathology and Bacteriology*, October, 1923.

epithelial columns and leads to fragmentation of the columns into discrete spheroidal vesicles. Vesiculation is not accompanied by any demonstrable biochemical disturbance of either nuclei or protoplasm of the epithelium, but the gland unit becomes so distended and distorted that it loses its identity. It will thus be seen that the process of formation by vesiculation is practically a passive accumulation in that epithelium; endothelium and sinusoid manifest no evidence of activity. It contrasts greatly with the active process of secretion described by Dr. Williamson and Dr. Pearse. In the process of secretion every element of the gland unit takes part. The epithelial nuclei, the cytoplasm and the microcapillary system all become laden with granules. The granules liquefy and the liquefied matter occupies the centre of the epithelium. The endothelial cells of the sinusoidal capillaries manifest granular appearance and a thin fluid appears in the sinusoid and the perivascular lymphatics surrounding it. There are no histological means of determining the nature of this fluid which occupies "lacunate follicles." The fluid has a distinct effect on the macroscopical appearance of the cut surface of the organ and the appearance is always that of salivary or pancreatic tissue and never that of colloid. Dr. Williamson and Dr. Pearse draw attention to the difference in the picture produced by these two processes. One gland unit is occupied in carrying out only one of these functions at any given time. In reply to the suggestion that secretion may pass from one gland unit to another for storage in an altered form as colloid, they point out that they have been unable to discover any anatomical channels whereby such transference could be effected. In regard to the significance of the two functional cycles Dr. Williamson and Dr. Pearse hold that colloid is a carrier or vehicle which, like the taurocholates or glycocholates of the bile, is continually in circulation in the body. Only the excess or reserve of bile is stored in the gall bladder and they suggest that only the reserve of colloid is stored in the thyroid gland. Dr. Williamson and Dr. Pearse also trace connexions between the thyroid and the thymus gland. They hold that the latter does not atrophy in youth, but persists and manifests a metamorphism coincident with the nature of the demands made upon its function; they suggest that the thymus gland is a storehouse for thyroid products. The parathyroid body likewise contains material similar to thyroid secretion and it is thought probable that it has been passed on from an actively secreting thyroid gland. Before this aspect of the subject is left, it is necessary to put forward Dr. Williamson's and Dr. Pearse's views of the relation of the colloid or vesiculation phase to the secretory phase. They point out that it is not possible to go further than the statement that the two phases are distinct and that each can be traced from the beginning to the final result. It is possible that colloid in the vesicle, once accumulated, is digested by the activity of the epithelium surrounding it and converted into the secretion of the lacunae. This

seems to be unlikely because large accumulations of secretion do not appear as colloid to the naked eye and because they have found no flow of colloid from one discrete vesicle into another with the formation of long irregular baggy follicles of lacunation. They regard it as most likely that reversion to an indifferent phase is necessary before the colloid phase of the epithelium passes over to a secretory phase.

Such are the views of Dr. Williamson and Dr. Pearse in regard to the anatomy and physiology of the thyroid gland. They do not claim originality for the whole of the work, but hold that their presentation of it is new. The way in which they apply their findings to various abnormal conditions of the thyroid is highly instructive. Consideration of this aspect of their work must be left for another occasion.

THE CULTIVATION OF REDWOOD.

It is contrary to our practice to publish editorial expressions of opinion concerning the wares advertised in our pages. The advertisements of proprietary preparations and foods are accepted only after the most searching inquiries have been made. When the preparations are manufactured in Australia, we are able to assure our readers that the claims made for these goods are justified. In other cases every care is taken to admit nothing that is not reliable and worthy of commendation. From time to time we are asked to give space to advertisements dealing with investments. Here again inquiries are instituted and reasonable care is exercised, so that the medical profession is not led astray by these advertisements. In a recent issue we published an advertisement of the New Zealand Redwood Forests, Limited, an undertaking that seems to us to merit the attention of those who have money to invest. We are departing from our usual custom in this instance because of the importance of afforestation to the Empire. The idea of the Company is without doubt an excellent one. The planting of a fast-growing tree on a large scale in a favourable situation is in itself worthy of support. The virtues of redwood are well known, not the least valuable property being the fact that it is highly resistant to fire. The Company is asking the public to take up debentures of thirty-five pounds each, which will bear interest at the rate of 3½% during the period while the trees are growing. At the end of this period the holders of the debentures will receive 90% of the profits accruing from the sale of the timber. Even if the anticipations of the management be oversanguine, after a period of from twenty-five to thirty years there should be a very large profit for distribution among the debenture holders. In other words this is an investment for the next generation. The money invested will not be entirely idle during the period of development. We advise our readers to make full inquiries before investing. The information should be obtainable without much searching.

Abstracts from Current Medical Literature.

THERAPEUTICS.

Treatment of Disease with Heavy Metals and Bactericidal Agents.

W. E. DIXON (*Tubercle*, October, 1925) states that the usual antiseptics, such as phenol, the coal tar derivatives (cresol, guaiacol) perchloride of mercury, "Formalin," are useless as internal antiseptics. They affect body tissues before they affect parasites and their action is destroyed by contact with tissue proteins. Formaldehyde combines in the body with proteins and loses all antiseptic power. "Cures" by essential oils (cinnamon, garlic) are unlikely. Fischer has shown that menthol eucalyptol injections into tuberculous rabbits are without effect on the disease. Thymol and the cresols in strengths of one in ten thousand inhibit (*in vitro*) the growth of human tubercle bacilli and possess greater powers than the other members of the group. Guaiacol and creosote are useless unless in concentration of one in one thousand, a strength which renders their effective employment impossible. Calcium chloride, since Maendl injected it in 10% solution into 250 tuberculous patients, has been vaunted for the treatment of tuberculosis; but calcium deficiency occurs in many diseases besides tuberculosis and while calcium may help to dissipate inflammatory exudates in that malady, it cannot influence the cause of the condition. Similarly, the use of silica produces no alteration in the tuberculous processes nor in the duration of life in affected guinea pigs. De Witt has claimed to have produced fibrosis and the healing of tubercles in certain chronic and slowly progressing lesions without the occurrence of nephritis by the use of mercurial compounds. Chavant has recommended inhalations of arsenic for the same conditions, but evidence is still lacking of any favourable influence upon the disease. The author claims, upon the other hand, that certain chemotherapeutic agents have a remarkable selective action upon tissues and bacteria, physical rather than chemical in nature. To quote an example, ethyl hydrocupreine or "Optoquin," in a strength of one in one hundred thousand arrests the growth of the diphtheria bacillus and is fatal to the pneumococcus in a dilution of one in four hundred thousand; isoctyl hydrocupreine (or "Vuzin") in a strength of one in seven hundred and fifty thousand has a specific action upon the diphtheria bacillus, but produces no effect whatever upon the pneumococcus. These drugs will act in the body as well as *in vitro* and may be administered in suitable medicinal doses. Of the acridine derivatives "Rivanol" has superseded "Trypanflavine" which was employed during the war for the treatment of infected wounds. "Rivanol" has a powerful action on

streptococcal infections (in mice) and is a great improvement upon any such agent previously in use. The tubercle bacillus is not destroyed by the chemotherapeutic agents which are known to destroy other bacteria. Thus, "Flavine" and its silver salts and various quinine derivatives are powerless to affect it. The use by French workers of cerium salts and of copper compounds by von Linden in Germany and Koga in Japan has produced no shrinkage in the incidence of tuberculosis. The author is of opinion, however, that copper salts may be useful in retarding the growth of putrefactive organisms in the intestine, since these salts are shown to be powerfully antiseptic and are not absorbed. In reviewing the case for the use of gold preparations for the treatment of tuberculosis, the author states that the results are not yet superior to those yielded by copper. In this field the work of Moellgaard has been anticipated by that of Koch, De Witt and Feldt, the latter of whom introduced a compound of very promising composition which he named "Krysolgan." In one part in one million this compound inhibits the growth of tubercle bacilli in culture; but in the animal experiments in which it has been employed the results have not been encouraging. Moellgaard's "Sanocrysin," the double thiosulphate of gold and sodium under a new name, will prevent the growth of tubercle bacilli in culture in strengths of one in eight million, but its action in the presence of serum is not accurately known. Moellgaard claims that "Sanocrysin" kills the bacillus *in vivo*; he assumes that the drug, itself non-poisonous, may thus produce a condition of "tuberculin shock," marked by albuminuria or hæmaturia and followed by myocarditis and pulmonary oedema and sometimes even by death. There is no evidence of "shock" according to Moellgaard in nontuberculous animals. In treating this shock or rather to guard against it Moellgaard recommends the use of a previous injection of antitoxic serum. In the author's view, however, there is no evidence of the liberation of tuberculous endotoxins following injections of "Sanocrysin" and the question arises whether or not a like "shock" may not follow the injection of other metallic substances. There are those who say that Moellgaard's control experiments have not been satisfactory and further that the cultures used by him were attenuated. Thus, concludes the author, Moellgaard's work, while suggestive, is nothing more. The results following the use of copper compounds and of "Krysolgan" have been equally promising and the results on the patients treated with "Sanocrysin" cannot be safely tabulated until years have passed.

Treatment of Scarlet Fever with Antitoxin.

F. G. BLAKE AND J. D. TRASK (*Boston Medical and Surgical Journal*, October 8, 1925) publish the conclu-

sions drawn after treatment extending over a period of one year and a half of one hundred and twelve patients suffering from scarlet fever of all degrees of severity. The authors made use of Dochez's unconcentrated serum by intramuscular injection. In the setting of a standard of dosage the presence of toxin and antitoxin in the patient's blood was first determined. The presence of toxin was demonstrated by the power of 0.3 cubic centimetre of the patient's serum to produce a local reaction in the skin of a susceptible volunteer when injected intracutaneously. The presence of antitoxin was determined by the capacity of 0.5 cubic centimetre of the patient's serum to produce blanching (Schultz-Charlton test) in a patient suffering with scarlet fever. The authors affirm that scarlatinal antitoxin in suitable amount is a specific and prompt cure for uncomplicated scarlet fever. It benefits the septic complications during the acute stage, apparently curing the specific toxæmia; but it has apparently no therapeutic value in postsarlatinal sepsis after the fading of the rash. To be efficient a serum should contain 12,500 minimal blanching doses (M.B.D.) per cubic centimetre and/or be able to neutralize at least 10,000 skin doses of toxin per cubic centimetre. The amount of antitoxin required to cure scarlet fever promptly and with certainty varies from three thousand to twelve thousand units, depending on the size of the patient and the severity of the disease.

"Mercurochrome" in Amoebic Dysentery.

V. B. WILLIAMS (*Medical Journal and Record*, October 21, 1925) reports the case of a negro with a history of having suffered from amoebic dysentery for several years. There was a continuous, bloody diarrhoea and the fresh stools contained *Entamoeba histolytica* in the free state, together with cysts of the same parasite. Emetine hydrochloride was used hypodermically in order to destroy the free forms and colonic irrigations of "Mercurochrome" in 5% strength, well diluted, were employed to attack the cysts. This latter drug was also given by the mouth. No signs nor symptoms of mercurial poisoning appeared during treatment. In the space of one month the diarrhoea ceased and the patient passed normal motions, his weight having increased in the meantime by 4.5 kilograms (ten pounds).

Value of Iodine Given Intravenously in the Treatment of Influenza.

C. P. V. SHUNKER (*Indian Medical Gazette*, November, 1925) reports his treatment by intravenous injection of iodine of sixty-six patients suffering from influenza in some cases of very severe degree. Having made use of cinchona, the salicylates *et cetera* with little or no effect, he resolved to resort to the use of iodine. He em-

ployed a dilution of 0.12 cubic centimetre (twenty minims) of the iodine solution in ten cubic centimetres of normal saline solution. In most instances the benefits following the injections were definite, more especially in those patients who were gravely ill and suffering from pulmonary complications. If the temperature did not fall and the general condition improve, a second injection of 0.24 cubic centimetre of the iodine was given in forty-eight hours. One patient received five such injections. There were no deaths in the series. The solution used consisted of iodide of potash four cubic centimetres in distilled water one hundred and sixty cubic centimetres to which was added four grammes of iodine.

UROLOGY.

Pyelographic Media.

R. C. GRAVES (*Journal of Urology*, December, 1925) contends that sodium bromide should not be used in a 25% solution as a medium for pyelography, because it is so irritating. Clinical experience and laboratory experiments show that a 12% sodium iodide solution is the most satisfactory medium. The addition of mercuric iodide to make a dilution of one in three thousand in the 12% sodium iodide solution renders the medium of distinct antiseptic value while it still remains unirritating to the urinary mucosa. No ill effects or discomfort follow its injection into either the kidney pelvis or the bladder even in the presence of acute inflammatory processes. The mixture results in the formation of sodium mercuric iodide, a stable compound. It is cheaply and easily prepared and is always ready for use.

Errors of Technique in Uretero-Pyelography.

W. A. FRONTZ (*Journal of Urology*, December, 1925) emphasizes the fact that in the interpretation of ureteropyelograms a clear understanding of the variations in the normal ureteral and pelvic outlines is essential. The realization that the ureter is an easily distensible muscular tube conveying urine from the kidney to the bladder by peristaltic waves will explain many variations in the ureteral outline which are often erroneously interpreted as strictures of the canal. The diagnosis of ureteric stricture is not justifiable unless the ureterogram reveals above the suspected area a definite pathological dilatation. The dilatation should be abrupt and not be the fusiform swelling which represents the normally wide lumen above a constriction caused by a contraction phase in the peristaltic wave. The diagnosis of renal neoplasm by pyelography is frequently difficult. A blood clot not arising from a tumour may cause a filling defect of the pelvis and may simulate that caused by a tumour.

A pelvis incompletely filled with the pyelographic medium or a spasm of the pelvis may also prove misleading. The normal pelvis varies greatly in outline. Thus in one of the author's cases in which the condition was subsequently proved to be normal, the middle calyx was missing and the upper calyx was very narrow and elongated.

Stricture of the Ureter.

W. E. LOWER AND G. W. BELCHER (*Journal of Urology*, December, 1925) discuss the ureterographic diagnosis of stricture of the ureter. If the point of a catheter will not go through the stricture, the result is often unsatisfactory on account of reflux of the opaque solution. If the fluid does pass through the stricture, it may be retained afterwards and set up colic. The technique advised is to pass a number 5 French catheter up to the face of the stricture and then pass a number 4 French olivary-tipped catheter up the ureter alongside the first catheter. The small catheter will often pass through the stricture into the dilated ureter above. Through this catheter the whole ureter above the stricture may be properly filled and later the opaque fluid may be removed.

Urinary Stones and Calcified Glands.

A. L. CHUTE (*Journal of Urology*, November, 1925) holds that in carrying out radiographic investigation on patients whose symptoms suggest the possibility of renal or ureteric stones, shadows due to calcified glands are often found. Usually these shadows can be distinguished from those of urinary calculi by their mottled appearance and also by their mobility, though retroperitoneal glands may be immobile. Occasionally the use of an opaque catheter with the production of stereoscopic films will be necessary to determine whether or not a given shadow comes from an intraureteric source. The diagnosis is sometimes confused by the fact that a patient whose radiogram reveals the shadow of calcified glands, may come complaining of pain in the loin or abdomen and sometimes in addition of urinary symptoms. The pain never simulates a true renal colic, but may be a mild ache such as is commonly found with a non-obstructing stone in the ureter or the renal pelvis. The pain is due not to the calcified glands, but to other glands that presumably accompany the latter and are still acutely inflamed. Occasionally the urine will contain pus or blood and any abdominal pain occurring in such a patient may originate either from the kidney or the inflamed abdominal glands.

Sarcoma of the Prostate.

H. C. BUMPUS, JUNIOR (*Journal of Urology*, November, 1925) declares that as a result of the rarity of sarcoma of the prostate and the reputed hopelessness of the prognosis little interest

has been manifested in the disease. The type of the sarcoma and the age of the patient largely determine the physical characteristics of the tumour. Thus he describes a lymphosarcoma occurring in a young man of twenty-eight years and composed entirely of a single type of cell growing rapidly and having little or no connective tissue stroma; it was felt as a large soft boggy tumour rather simulating a prostatic abscess. On the other hand another lymphosarcoma of the prostate observed by the author in a man of sixty-four years was felt as a uniform enlargement, hard, tense and adherent. A fibrosarcoma will grow more slowly and even be somewhat hard and nodular, being regarded therefore as a carcinoma, especially in old men in whom the growth of the tumour is still slower. At the other extreme a myxosarcoma in a child of three was very large, soft and boggy. Of an intermediate type was a myosarcoma observed in a man of sixty years. This tumour was firm and elastic and had neither the doughiness of the myxosarcoma, nor the firm resistance of the fibrosarcoma. The disease is undoubtedly more frequently discovered and diagnosed in children than in adults. Before the introduction of radium the fatal course of the disease was rapid and the patients did not recover after surgical intervention. Of the five cases reported by the author, the results of radium treatment are apparently good to date in three. One patient is still living seven and a half years, another three and the third two years after treatment. X ray treatment was used to supplement the radium.

Methylene Blue in Tuberculous Cystitis.

H. BLANC (*Journal d'Urologie Médicale et Chirurgicale*, August, 1925) gives the exact technique of intravesical instillation of methylene blue into the tuberculous bladder. Methylene blue is found to relieve greatly the painful and frequent urination from which these patients suffer, but a very careful technique must be followed or else its local application will result in increased rather than decreased irritability of the organ. One gramme of methylene blue, chemically pure, must be taken and dissolved in one hundred cubic centimetres of normal saline solution. The solution is then boiled and filtered. It should be lukewarm and should be injected carefully through a catheter every few days according to the reaction. At first only two to five cubic centimetres should be introduced according to the state of the bladder. This quantity is gradually increased until the bladder will take ten cubic centimetres without showing any signs of intolerance. Should the pyuria be great, the bladder should first be gently cleansed with warm normal saline solution. With very intolerant bladders it may be necessary to commence with a 0.5% solution.

British Medical Association News.

SCIENTIFIC.

A MEETING OF THE VICTORIAN BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held in the Medical Society Hall, East Melbourne, on February 3, 1926, DR. H. DOUGLAS STEPHENS, the President, in the chair.

The Human Erect Posture.

PROFESSOR WILLIAM COLIN MACKENZIE delivered a lecture dealing with recent researches on mammalian development entitled: "The Principles and Medical Significance of the Human Erect Posture."

The lecture was divided into two parts. The first part dealt with principles and their application to medical practice. The second was devoted to a series of original still and moving picture illustrations.

In his introduction the lecturer drew attention to the fact that although infirmaries for the sick were everywhere on the increase, yet they seemed unable to cope with the crowds of "chronic patients" waiting for admission. The chronic patient was the great problem in medical practice today, but, as Joel Goldthwait, of Boston, had pointed out, too often were they content to treat acute symptoms of chronic disease as if they represented the disease. In spite of hospitals, drug and preventive measures it would appear, as Sir Thomas Horder had recently remarked, that as old diseases disappeared or tended to lose their virulence, new ones took their place. Cholera and typhus fever had gone, but influenza and encephalitis had appeared. Too much stress was being laid on the attacker and too little on the attacked. Behind the question of what caused infection was the basic one of why infection occurred. As human development had been along physiological and not pathological lines, it followed that to obtain a knowledge of the factors that constituted health as against disease they must know the history of human development and this could be obtained only by a study of Nature's own experiments. Through these, the most noticeable of which could be observed in the members of Australian fauna, they had a check on Nature's methods. This comprised living embryology and by this means they could not only study structure, but also function on which structure depended. The decisive struggles had taken place ages before the mammal became erect. What had dominated the transition from the lowly lizard, through monotremes and marsupials, rodents, lemurs, platyrrhine and catarrhine monkeys up to the anthropoid apes and finally the erect mammal? In the transition "sports," "monstrosities" and "precocious developments" had played no part. Through the study of structure, however, a definite sequence which might be termed the law of mammalian development, was recognized.

It was recognized that the human was of all mammals the most intelligent and the most erect and certain factors were discussed to which this supremacy had been ascribed such as the influence of the ductless gland system, generative system and special sense development. Discussing the influence of hormones the lecturer pointed out that a study throughout the mammalia showed the instability of the ductless gland system. In the members of the Australian fauna could be demonstrated the glands found in man and also three new ones not so far found in the human body. Only in one mammal—the platypus—were the parathyroids constantly present.

With regard to the influence of prolonged retention of the fetus *in utero* it was pointed out that in the reptile viviparous birth occurred and the marsupial had solved the problem of living embryonic birth.

Furthermore, as evidence that changes in the generative system had not been decisive factors in higher mammalian development they found in the Tasmanian devil, an animal in many ways the most degenerate of all the marsupials, advanced changes in the external genitalia towards the higher mammalian type, including the genesis of the perineum. With reference to the advancement being

dependent on changes in connexion with the special senses such as vision and smell these alone could not be regarded as decisive factors in ascent, but variable according to the needs of the animal. Already in the lowly lizard interesting experiments had been performed in connexion with smell and vision.

The lecturer next dealt with fundamentals for comparison in mammals regarded as being in the direct line of human development, pointing out that, just as in connexion with the diagnosis of human disease, it was not enough to consider one factor only, they had to consider a combination of correlated factors. If fundamentals were sacrificed, special sense specialization could not lead to the development of the higher type.

Its richly convoluted brain did not impel the echidna forwards—the muscular and intestinal correlations were not suitable for the development of the higher mammal.

A structural comparison, both macroscopical and microscopical, was next drawn between the human type as representing the "highest" mammal and one of the "lowest" mammals, the common marsupial Australian phalanger or opossum (*Trichosurus vulpecula*), and it was pointed out that the distinctions between them were more apparent than real. The difference was actually one of posture. Man had the erect posture, the common phalanger had not. Although arboreal and able to reach for the gum leaf above its head and sit up and feed itself using its hands, yet when on the ground it progressed on all the four limbs. It used its front limbs for bodily support and bodily propulsion. Compared with man its buttock and patellar regions were relatively poorly developed. Pointing out that the great epochs culminating in higher mammalian development were represented by improvements in muscular function and that the influence that had been working down the ages resulting in *Homo sapiens*, was the muscular response to the urge to become erect, the lecturer traced the development of the erect posture through the lowly blue-tongued lizard crawling on its belly wall and using its limbs for bodily propulsion and not for bodily support, the bearded lizard showing the genesis of limbs being used for bodily support as well as propulsion, the monotremes (platypus and echidna) in the latter of which the belly wall was raised well off the ground, the limbs being used definitely for support as well as propulsion. He then dealt with the experiments to throw the body on to the hind limbs so as to free the fore limbs from bodily support and bodily propulsion and its development through the lemurs, catarrhine monkeys, anthropoid apes, primitive man, up to modern man. In such a simple form of life as amoeba two factors in its existence were movement and assimilation. These were dominant right through the mammalia up to man. The brain had not been the impelling force for higher mammalian development. It was the structural register of function. The power of movement resided in one structure of the body—the muscle cell. The human infant spent two or three years in acquiring balance and developing speech. They had not reached that stage in development when the child could assume the erect posture immediately after birth. The erect posture which was the basis of human intelligence, was effected by muscular action and was maintained by muscular action. It was but recently acquired and hence was unstable and readily attacked by disease. At the conclusion of this portion of the lecture practical applications of the principles in medical practice were briefly dealt with, such as muscle reeducation in infantile paralysis, heart and respiratory disease, neuro-muscular conditions, intractable dysmenorrhœa, the dull and irritable child and visceroptosis. A physical examination by Dr. Vera Scantlebury of the girls of six leading secondary schools in Melbourne showed that in 1,549 pupils examined 74.6% of defects were postural. The girls represented the intellectual types of the community being reared under favourable hygienic conditions.

In the hospital of the future a primary consideration in treatment should be given to Nature's methods. They were intent on surgical wards, theatres and equipment, but an essential in any public hospital was a great department of myology, so that in all cases a scientific

examination could be made for muscular defects, their importance assessed and remedies offered for their cure.

The second part of the lecture was devoted to still and moving pictures. The still pictures illustrated dissections and diagrams of correlated changes which had taken place, demonstrating that just as the muscular epochs resulting finally in the human erect posture showed reaction on brain development, so also did they show reaction on every portion of the body. The systems dealt with particularly were the gastro-intestinal, muscular and the central nervous. The history of development of the human gastro-intestine was first demonstrated, beginning with the simple condition in the blue-tongue lizard with a miniature spleen without great omentum and lesser sac; next the bearded lizard manifesting the genesis of caecum, right colon, duodenum and gut fixation and followed by the condition in monotremes, rodents, lemurs, new and old world monkeys, anthropoid apes up to the human. A complete sequence in development was demonstrated. It was pointed out that the human colon consisted of but two portions, a right or mesenteric and a left or mesocolic. This was important to the pathologist as well as the physiologist. The relationship of the colon to the lesser sac was explained, also the method of gut fixation and the development of the base of the mesentery. In connexion with the muscular system the illustrations were of actual dissections dealing with the history of gluteal and patellar development which it was pointed out must be regarded as "areas of unrest." Here again a sequence in development was demonstrated beginning with the giant iguana of Australia through the mammalia up to man. In dealing with the central nervous system stress was laid on the importance of a correct understanding of the reptilian brain. The brain of the two groups of lizards—one represented by the blue-tongued and stump-tailed lizards and the other by the bearded and frilled lizards—were compared and the histories of the thalamus, hippocampus, ventricle and *corpus striatum* were demonstrated. It was emphasized by the lecturer that in studying the effects of the special senses on human development a commencement should be made with the lizards of Australia.

The moving picture series, dealing with the assumption of the erect posture, showed movements in the blue-tongued lizard, bearded lizard, platypus, echidna, koala or native bear, common phalanger, kangaroo, catarrhine monkey, orang and chimpanzee. By means of a pure Australian aborigine the stages between the anthropoid and the Tasmanian, illustrating the efforts of primitive man to become erect, were demonstrated. It was mentioned by the lecturer that these final stages had apparently all occurred in Australia and he made the preliminary announcement that the skull of early primitive man had recently come into the possession of the National Museum of Australian Zoology.

DR. PAUL DANE said that he found himself in a very difficult position in opening the discussion. He felt that he could not criticize Professor MacKenzie's paper, but he hoped to be able very briefly to amplify and extend his remarkable conclusions. No matter what individual opinions might be held regarding the correctness of Professor MacKenzie's theory of the development of the human brain through the experiments of Nature in finally producing a being quite erect, all would be of one opinion that Professor MacKenzie had given them a scientific treat.

Professor MacKenzie's work was known to all, it was also known beyond Australia. But it might not be generally appreciated that Professor MacKenzie had approached his scientific researches along the road of general medical practice. Most of the giants of the medical profession from Hippocrates and Galen down through Harvey, Hunter, Lister, Charcot and James MacKenzie had trodden the path of medical practice and it was only thus that men could develop that wide outlook and sympathetic understanding necessary to maintain their zeal in the prodigious effort of the search for truth. Nature did not yield her secrets easily and when at last a pioneer wrested from her an atom of truth he was not always rewarded by the sympathetic understanding of his fellows.

Professor MacKenzie was essentially a medical man and his work had been carried out with the single purpose of endeavouring to discover if possible some fundamental

ideas regarding human development, by the application of which medical practice might be made more scientific and human suffering lessened.

Since the war he had had the privilege of being closely associated with Professor MacKenzie and his work, more particularly with the work on cerebral comparative anatomy and he had watched the development of his ideas on cerebral evolution with growing interest. During the course of this work the theory of brain evolution from one or more of the special senses was examined and found wanting; the idea of development along these lines was inadequate as a great fundamental principle of either evolution or dissolution of the brain.

It was a well known fact, apart altogether from medicine, that wherever a large number of more or less similar phenomena were observed, it was probable that underlying the whole was some great fundamental basis. Many conditions in the human subject, regarded from the viewpoint of the development of the erect posture, appeared as the results of congenital weaknesses in this factor or dysgenic agencies upon it. Thus occurred flat feet, talipes, tuberculosis of knee, hip, spine, spondylitis, scoliosis, lordosis and other apparent breakdowns in the bony skeleton. To these were to be added all the muscular and neuro-muscular conditions resulting from the dissolution of cord functions. He might instance two patients whom he had seen that day, one a man in whom every extensor muscle subserving the erect posture had suffered from some dysgenic agency, a neuro-muscular dystrophy and the other a man in whom the only lesion was an atrophic paralysis of both gluteal muscles.

In how many of such conditions was the erect position attacked. A peculiar attitude was associated with nearly all of them. An obvious bend or stoop gave a similar appearance to the subjects of *paralysis agitans*, post-encephalitic disorders and certain states of mental depression. It appeared to him that even the osteo-arthritis of the hip of elderly people was an effort of Nature to help to stabilize the erect position which had been constantly strained through years of work. All of these apparently dissimilar states could be recognized as various instances of the influence of strain and disease on a function that was biologically young and therefore unstable.

The correctness of Professor MacKenzie's views became more and more apparent the more one studied the beautiful anatomical dissections which he had made on the brains of the Australian fauna; more than a perfunctory examination of these was necessary to grasp the correlation between cerebral development and the evolution of the erect posture. When the connexion between these two processes was clear, a vast amount of physical deformity in human beings was reduced to a focus; there was a great fundamental basis of evolution and dissolution.

Dr. Dane said that he wished to give some figures relating to the medical examination of recruits for military service as supplementing the figures of physical deterioration given by Dr. Vera Scantlebury and quoted by Professor MacKenzie. In Australia the number of men rejected as medically unfit for war service was 87,127, representing 20% of the total of 416,809 men examined. The number examined at the time of the conscription referendum was 190,869 and of these 80,006 (40%) had been rejected. It was stated in the annual report for 1924 of the Chief Medical Officer to the Board of Education, England, that of ten thousand rural children selected at random 20% were obviously defective in general physique; in some parts as many as 54% were physically defective. The rejection rate for active military service in the United States of men between the ages of twenty-one to thirty-one was approximately 21%. In the first draft for the late war it had been 33%.

In Great Britain the rejection rate of men between the ages of eighteen and forty-two years had been 64%. Of every nine men of military age in Great Britain on the average three were fit, two definitely infirm, three were physical wrecks and one a chronic invalid. What had they to learn from all this? One thing at least, that they must study and apply scientifically the time-honoured principle of rest. Did they rest their patients in a biologically scientific manner and did they rest them long enough?

In conclusion Dr. Dane said that he appreciated the compliment of having been asked to open the discussion and again expressed his admiration of Professor MacKenzie's brilliant demonstration.

DR. WALTER SUMMONS, O.B.E., said that when asked to speak he had agreed with pleasure, for it was on his suggestion that the Council had arranged with Professor MacKenzie to address the Branch.

When epidemic poliomyelitis made its appearance in Victoria in 1925 he (Dr. Summons) had been appointed one of a committee to advise on measures for the control of the disease and to take steps to insure that those affected with paralysis would receive adequate treatment. He, therefore, had taken opportunity to discuss the matter with Professor MacKenzie, who pointed out the influence of the erect posture in human beings on the treatment of this disease and generally on the health of the race so attractively that it seemed desirable that he should place his views before the members of the Branch.

Great progress in preventive medicine had been made by the study of the causation of disease and although the possibilities of this method were by no means exhausted, there was no doubt that the study of comparative zoology and the development of the physical characteristics of the human body would also aid in the advance of hygiene and preventive measures. He was not in a position to discuss the wide range of zoology and comparative anatomy covered by the lecturer, but the fact was obvious that disease and the maintenance of health must be studied on the broadest lines.

Professor MacKenzie was distinguished by his wonderful researches on the Australian fauna. In this respect he stood alone in Australia.

DR. H. F. MAUDSLEY said that he had found Professor MacKenzie's practical demonstration of the evolution of the animal series from a muscular point of view extremely interesting. They who had been more used to hearing phylogenesis propounded from the standpoint of brain development, appreciated deeply what Professor MacKenzie had put before them. He had shown them the importance of the erect posture in the development of the neopallium in its most advanced stages. The subpallial nervous structures must of necessity become more complex to provide for balancing and the more complicated movements executed in the upright position. This in turn meant a more highly evolved pallial development to maintain the movements and postures. It was interesting to note how the *corpus striatum*, once the all-important cerebral structure, had gradually dwindled in significance until in man its function was probably that of inhibiting the tonus maintaining structures in the midbrain. Postural defects must give rise to disordered proprioceptive impulses going to the brain and these probably accounted for many functional nervous symptoms.

He wished to express his appreciation of Professor MacKenzie's valuable paper.

PROFESSOR F. P. SANDES, invited by the President to contribute to the discussion, said that he did not feel competent to criticize Professor MacKenzie's demonstration. He gathered that Professor MacKenzie was an opponent of the theory that human development had followed upon progressive complexity of the brain and held rather that the structure of the human brain was a concomitant of man's having attained the erect posture. It occurred to him that in birds, insects and anthropoids there was no evidence of increasing complexity in neuronic arrangement, although these genera were capable of assuming the erect attitude in varying degree.

He was profoundly impressed by Professor MacKenzie's excellent work as a comparative anatomist and the suggestion that hospitals should establish departments of myology appealed to him. Perhaps the same object would be obtained by expanding the orthopaedic clinics into departments for the study and treatment of diseases of locomotion.

With reference to the figures quoted by Dr. Dane concerning the proportion of rejects in the examination of

recruits for active service, Professor Sandes expressed the opinion that some reserve was necessary in gauging the significance of such figures. He had been a member of a medical board whose duty it was to overhaul the rejects in New South Wales. In certain parts of the State there was very great objection to conscription and it was in these areas that "visual defects," "heart disease," "shortness of breath" and such like were prominent among the causes assigned for rejection.

Professor Sandes expressed the pleasure he felt in being present and tendered his thanks to Professor MacKenzie.

DR. H. DOUGLAS STEPHENS, the President, said that he had followed Professor MacKenzie's demonstration with much interest and had been particularly interested in his description of the evolution of the human intestine. It would perhaps be appropriate if he mentioned two common anomalies in the mesenteric attachment of the intestine met in the course of surgical work amongst children.

In the first place he had noted that the preponderating majority (he assessed it as 90%) of infants requiring operation for intussusception exhibited no attachment of the colon to the posterior abdominal wall or alternatively a very long meso-colon.

In another group of children in whom the condition necessitating operation was intestinal obstruction, it was found that large and small bowel were enveloped in one mesentery which had a narrow base of attachment, the so-called universal mesentery.

He inquired of Professor MacKenzie if either of the conditions he had mentioned could be regarded as a reversion to a more primitive type of intestine.

Professor MacKenzie in reply expressed his appreciation of the reception accorded his paper.

Dr. Stephens had introduced the question of fixation of the intestine, a large subject on which they might spend a whole evening. The types of intestine he had described fell short of the human pattern and it was a point for investigation to determine whether they represented primary or compensatory errors. The sequence of gut fixation was along the lines he had demonstrated by means of lantern slides and was intimately related to the attainment of the erect posture. In reply to the remarks of Professor Sandes the lecturer mentioned that the object of his address and illustrations was to present evidence showing the sequence in development of the erect posture from the blue-tongued lizard (*Tiliqua scincoides*) up to man.

He was indebted to Dr. Winifred Smith for the dissections from which the lantern slides had been prepared, to Mr. William J. Owen, Histologist to the National Museum of Australian Zoology, for the brain preparations and to Mr. Victor Cobb, Science Artist at the Museum, for the drawings.

The National Museum which would shortly be moved to Canberra, dealt with the problems of zoology from the medical standpoint or in other words existed for the study of zoology from the point of view of medical and surgical practice.

Professor MacKenzie reminded his audience of his appeal for Australian zoological specimens made through the medium of THE MEDICAL JOURNAL OF AUSTRALIA. The opportunity for the study of the Australian fauna was fast disappearing, as the animals were becoming increasingly difficult to obtain.

NOMINATIONS AND ELECTIONS.

THE undermentioned have been elected members of the Victorian Branch of the British Medical Association:

Almond, Robert Lester, M.B., B.S., 1925 (Univ. Melbourne), Orbest.

Berman, David, M.B., B.S., 1924 (Univ. Melbourne), 242, Abbotsford Street, North Melbourne.

Rush, Kevin Patrick, M.B., B.S., 1924 (Univ. Melbourne), Richmond.

Ryan, John Eugene, M.B., B.S., 1925 (Univ. Melbourne) (Travelling).

THE undermentioned has been elected a member of the Queensland Branch of the British Medical Association:
Hishon, Mortimer John, M.B., 1925 (Univ. Sydney),
Brisbane.

Medical Societies.

THE MELBOURNE PÆDIATRIC SOCIETY.

A MEETING OF THE MELBOURNE PÆDIATRIC SOCIETY was held at the Melbourne Hospital for Sick Children on September 9, 1925, DR. LIONEL HOOD, in the chair.

Actinomycosis of Parotid Region.

DR. R. M. DOWNES, C.M.G., showed a male patient, aged thirteen years, who had been admitted into hospital with the history that five months previously he had received a kick in the left side of the face while playing football. His face had become a little swollen and tender and had remained so for three weeks, when a carious upper molar tooth was extracted. From that time onwards the swelling had gradually increased in size and the left side of the face, neck and mouth had become acutely painful. On examination at this stage a large "brownish" looking swelling had been present on the alveolar margin of the left upper jaw with some swelling of the parotid gland and some degree of left upper cervical adenitis. The alveolar swelling had been incised, but no pus had been obtained, the sensation of incising the swollen tissues had been as though an unripe pear were being cut. During the next three weeks the alveolar swelling had decreased in size, but the parotid swelling became larger and four weeks later small fluctuant areas had appeared beneath the skin of the parotid and mandibular regions. These had been aspirated with the removal of sero-sanguineous fluid. No pus had been present. The glands of the left side of the neck by this time had become hard and swollen and a few days later the swelling of the parotid had broken down and discharged thick greenish-yellow coloured pus. The child had been treated by small doses of iodide of potash, 0.6 gramme (ten grains), three times a day for four weeks, then arsenic had also been tried, but with no improvement. Only on the day of demonstration had the pathologist reported finding the streptothrix actinomycetes.

DR. COLIN MACDONALD pointed out that in Europe he had seen favourable results of actinomycoses treated with X ray therapy. In this case he suggested X ray therapy as being particularly indicated, as there was a good deal of keloid formation in the region of discharging sinuses.

DR. J. W. GRIEVE said that he had seen one case of actinomycosis treated by means of X ray therapy with rather alarming results. The whole area of infection had been considerably activated and the patient had become more ill after the application of X rays. The patient had subsequently been cured by means of the internal administration of large doses of potassium iodide and intramuscular injections of colloidal iodine.

DR. DOWNES in replying said that he proposed treating the patient with large doses of potassium iodide and that if the result was not favourable, he would then consider the question of autogenous vaccine and the therapeutic application of X rays.

Wrist Drop.

DR. DOWNES also showed a male patient, aged nine years, who suffered from wrist drop following a fracture of the lower end of the humerus treated by application of a Jones extension arm splint. The child had had a fall and sustained a transverse fracture through the lower end of the humerus. The lower fragment had been displaced backwards. A Jones arm splint with extension had been applied for six days. Then treatment had been continued by rest and in an arm sling. Two weeks later the child was found to have a complete wrist drop and the arm had been "put up" on a cock-up splint. The wrist drop four weeks after original injury had considerably improved.

DR. DOWNES considered the wrist drop to be a direct result of the Jones splint, the ring causing pressure of the radial nerve against the humerus, just as has been known to occur in so-called "crutch palsies."

DR. H. C. COLVILLE said that the question of the radial nerve paresis might be an immediate or late result of injury to the radial nerve at the elbow joint or supra-cordylar region. He would like to ask Dr. Downes if the triceps muscle was injured in this child.

DR. DOWNES in replying said that the wrist drop appearing three weeks after the injury might mean that the radial nerve was involved in callus formation. This was very questionable, however, because of the fact that the condition of muscle paresis was definitely improving. He (Dr. Downes) merely showed this patient to demonstrate one fallacy in the use of a Jones arm splint. He considered that the counter extension caused pressure and so oedema about the radial nerve, hence the temporary muscle paresis.

Talipes.

MR. W. KENT HUGHES next presented several patients in whom the end results of treatment for talipes were demonstrated.

The first patient was a man, aged forty-one years, who at the age of eighteen years had undergone an operation on his right foot for relief of a gross degree of *talipes equinovarus*. Both feet were affected, but only one had been treated by operation. Also the man had some degree of spasticity in his upper limbs with a tendency to "claw hands." At the operation about a 6.25 centimetre (two and a half inch) wedge with the base outwards had been removed from the neck of the *talus* and about a 7.5 centimetre (three inch) wedge from the *os calcis*. The foot had been swung through an arc of about twenty-five centimetres (ten inches) in order to get the foot straight. The patient had not been seen since operation until three years ago. Mr. Kent Hughes pointed out that the man had a very good and useful right foot, whereas the left foot (absolutely untreated with an exception of a special boot) illustrated an extreme degree of "club foot" deformity. Mr. Kent Hughes held that the case proved that the deformity of the *talus* and *os calcis* was the cause of *talipes equinovarus* and that no amount of "wrenching and manipulative treatment" would do any appreciable amount of good to the condition.

The second patient was a man, aged twenty-eight years, with *talipes equinovarus* or deformity due to the shortening of the plantar flexors of the foot. He had been treated by operation. A wedge of *talus* and *os calcis* had been removed and prolongations of plantar fascia had been cut. The foot had been perfect until one year previously, since when he had been neglecting after treatment exercises, leaving off night shoe and so forth. This had allowed overgrowth of the *talus* and *os calcis* to some extent and the condition showed a tendency to recur. Dr. Kent Hughes pointed out that pressure inhibited overgrowth, hence he strongly advised the wearing of a night shoe after these operations.

The next patient suffered from *talipes equinovarus* treated successfully by removing a wedge of the *talus* and *os calcis* combined with section of the plantar fascia and of the Achilles tendon. This patient was a female, aged twenty-eight years, who as a child had suffered from poliomyelitis and at the age of twenty-four the metatarsal bones of the right foot had been practically in the line of and parallel with the tibia and fibula. Mr. Kent Hughes pointed out that she had a very good and useful foot with a very limited degree of dorsiflexion only. He emphasized the necessity in the treatment of *talipes equinovarus* of removing an adequate amount of bone wedge and the importance of dividing thoroughly the plantar fascia and all its deep prolongations into the foot as well as the Achilles tendon. The cavity part of the operation, namely the tenotomies *et cetera*, should be performed prior to the talipes portion, the bony operation.

DR. RUPERT M. DOWNES, C.M.G., said that they were indebted to Mr. Kent Hughes for numerous excellent results

from operative treatment of talipes. He would like to ask Mr. Kent Hughes whether he would perform open operation on talipes in a baby during the first few years of life; how long would he keep up manipulative treatment before operating and what time should be allowed to elapse after operation on a patient with talipes before the muscles were allowed to perform their true function?

Mr. Kent Hughes in reply said that he would perform manipulative treatment for six months and if he could not correct the deformity during the first six months of life, he would operate. He would like to emphasize that the *astragalus* was the bone to be observed and considered. He recognized three types of *astragalus*: infantile, midadult and adult. The muscles and ligaments could be almost disregarded. It was deformity and not displacement that was the cause of talipes and the bones involved were the *talus* and the *astragalus*. He considered that a bone operation should not be performed in children under the age of eighteen months. If correction could not be obtained before the child was six years old, it would be necessary to perform tarsotomy.

He would advise all orthopaedists not to lose sight of a patient operated on for *talipes equinovarus* until at least four years had elapsed.

He never performed the operation of transplantation of tendons because it consisted in removing a strong muscle to another position of mechanical disadvantage, where the deformity could be overcome in other ways.

Heliotherapy and Tuberculous Disease.

Mr. Hughes's next patient was a boy, aged six years, who three years previously became affected by cervical adenitis which proved to be tuberculous. Many glands had suppurated and the whole had been removed by dissection. A few months later the child had suffered from cervical caries, his parents had noticed that he was bending his head forwards. The child had then been put in a plaster jacket for three months. During this time he had suffered from a retronasopharyngeal abscess which was treated by incision from inside the mouth. This boy had then been put on a double anterior Thomas's splint suspended above the floor on metal stays about sixty centimetres (two feet) high, so that nursing of the patient was made easier. He had been allowed to lie on his splint naked and exposed to the sun and even when not in the sun he had been attired in a thin flannelette garment. After ten months of such treatment this boy had been able to move and raise his head and his general condition had been greatly improved. In fifteen months he had been taken off the splint and had been allowed to sit up for a little each day. In eighteen months he had been very well indeed and able to walk about, until at the time of the meeting the boy appeared to have a normal cervical spine and was in excellent health.

A series of X ray pictures was shown. In the early pictures the cervical caries could be clearly seen and in the latest no evidence of such a condition was present.

Osteomyelitis.

Mr. Kent Hughes regretted that the patient illustrating a bad result in a case of osteomyelitis treated radically by diaphysectomy could not be present at the meeting. However, this was one of his few failures. He attributed failure in such cases to the operation having been done when the infection had become subacute either because of previous surgical interference, because of the infection being of low virulence or of the patient's resistance being particularly high.

He still claimed that diaphysectomy was the ideal operation in the treatment of acute osteomyelitis.

Dr. H. C. COLVILLE said that he was sorry more of the other senior members of the honorary surgical staff were not present, as he would have very much liked to have heard their views on the immediate treatment of acute osteomyelitis. He said he was influenced by the consensus of opinion which for the most part was against diaphysectomy, because the question of complete regeneration of the shaft of a bone was a vexed one. He believed there were two possibilities in regard to long bone regeneration.

One consisted in regeneration brought about at the epiphyseal end and the other in the new bone as laid down by the periosteum.

He considered that if early diaphysectomy were performed, then there would be no epiphyseal end regeneration and periosteal regeneration only would be possible. He considered that the diaphysectomy should be an operation reserved till later on when a sequestrum had formed, in other words, early and complete drainage should be established and later sequestrectomy performed.

Dr. C. J. O. BROWN said that in Aberdeen in 1924 Mr. Alexander Mitchell had performed the operation of diaphysectomy in seventeen cases of acute osteomyelitis confined to the femur and tibia. The after treatment consisted in the limb being put in some form of extension and "Eusol" dressings used. These cases had been demonstrated with lantern slides at the British Congress in 1924 and of the seventeen cases only one case in which the tibia was affected, was regarded as a failure. In all the successful cases a short convalescence had been an outstanding feature.

Encephalitis.

Dr. J. W. GRIEVE showed a female child, aged four years, who was suffering from encephalitis. The child had had the typical appearance found in tuberculous meningitis. Lumbar puncture had been performed with the escape of clear cerebro-spinal fluid under greatly increased pressure; the microscopical examination of the cerebro-spinal fluid had revealed two hundred and twenty lymphocytes per cubic centimetre. This condition had been regarded as one of tuberculous meningitis. However, improvement in the child's condition had become manifest a few days after admission. This improvement had continued daily, until the child was apparently normal except for a slight degree of ataxia in the arms.

A microscopical examination of the cerebro-spinal fluid a few days previously had revealed nothing abnormal. Dr. Grieve remarked that he had not seen a case of encephalitis in which high lymphocytic count was found on examination of the cerebro-spinal fluid and he showed this patient because of the difficulty of diagnosis.

Dr. LIONEL HOOD said in the diagnosis of encephalitis he always regarded a microscopical examination of the cerebro-spinal fluid as the best guide.

Dr. Grieve said that in his patient the sudden onset with very obvious motor restlessness was greatly in favour of encephalitis, whereas the high lymphocytic cell count in the cerebro-spinal fluid was against encephalitis and rather in favour of tuberculous meningitis. He had also seen such patients return at some later date with typical tuberculous meningitis.

Tetanus.

Dr. R. G. WEAVER next showed a male patient, aged six years, who had suffered from tetanus. He said he was showing the patient because of the success which followed serum therapy, although the period of incubation was only two days. Five days previous to the onset the child had received a punctured wound over the left parietal bone, due to having fallen against a rusty nail. Two days later the muscles of his neck had been noticed to be stiff and this stiffness had gradually progressed. On the day prior to admission into hospital the legs were noticed to be stiff.

On admission the patient, a well developed boy, had suffered from generalized rigidity with opisthotonus. Frequent spasms had been followed by profuse sweating and a definite *risus sardonius* had been present.

A punctured wound had been present over the left parietal region of scalp. The abdomen had displayed a board-like rigidity. The limbs had been rigidly flexed. The child had been regarded as suffering from tetanus and had been treated by means of antitetanic serum for a period of sixteen days. The serum had been given daily into the spinal theca, intramuscularly and subcutaneously. In all 135,000 units of serum had been given.

The child was quite free from spasms, was able to move his limbs quite well, though he still had some degree of residual trismus. His general condition was improving daily.

Rickets.

DR. DOUGLAS GALBRAITH next showed a child, aged eight years, a female, who was suffering from many typical rachitic deformities. Slight bossing of head, fiddle chest, moderately well marked "rosary," very definite enlargement of the epiphyses at the wrists and to a lesser extent at the ankles and *genu valgum* were present. This little girl had been born in London and both hygienic and dietetic conditions were poor, although she had been breast fed up to one year. The case history brought out one or two interesting features. She had not been allowed on her feet until she was four years old "because the bones were too soft." For the whole of the fourth year she had attended Great Ormond Street Hospital, where cod liver oil had been administered, the legs put in splints and the mother had been advised not to allow the child to try to walk. When four years of age the child had made absolutely no improvement and weighed only 7.6 kilograms (seventeen pounds). At this time the family had come to Australia and the mother "decided to let her try her legs." In a very short time she had been running about alone, growing, putting on weight and in a year's time the legs had been practically straight and the child's weight and height had approached the average. The authors of textbooks still advised keeping these children off their feet, but Dr. Galbraith thought they would agree that this child's history testified in a striking way to the truth of Leonard Findlay's teaching that if they were taught to walk and the muscles were thoroughly massaged, most of the deformity would gradually disappear, whilst their general health improved remarkably.

In this girl the present *valgus* deformity had reappeared during the past year. It was difficult to account for this, for hygienic and dietetic conditions had been very good and there had been no serious illness. The mother stated that the child had grown enormously during the past year and it might be that the rapid growth had been responsible for the recurrence of the deformity.

It was of interest too that the radiogram of this child who was running about and apparently in the best of health, revealed a degree of rachitic bony change as severe as that seen in other children who had never even attempted to stand. The discrepancy between the clinical and radiographic features had been previously described. In the same way cod liver oil might be administered to children and their bones brought to normal again and yet they would make no attempt to stand and clinically remain as rachitic as before. Dr. Galbraith thought they were too apt to consider only the bony changes in rickets and to overlook the other features, particularly the condition of the muscles.

With regard to treatment of the *genu valgum* generally speaking after six years of age it was difficult to correct the deformity by manipulative measures alone and bone operations were usually required. But the very deficient calcification of the bones in this patient would lead him to try Mr. Kent Hughes's suggestion and treat the patient with a walking splint, with massage of the muscles and the administration later of cod liver oil and phosphates to aid calcification in the straightened position. Failing that it would be necessary to decide on osteotomy of the femur.

Obituary.

RODERICK ALEXANDER MACLEOD.

If eminence in the medical world depended on erudition, resource in trying circumstances, self-reliance, efficiency in all branches of medical practice and a thorough understanding of human nature, the leaders of the profession in the university centres would discover serious rivals in some of their colleagues in the "out-back." With meagre

facilities some of these men have not only applied their considerable knowledge to the immense advantage of those under their care, but have added to the general fund of knowledge by skilful observation and unaided study. The attainments of such a man as Roderick Alexander Macleod, whose death occurred on February 2, 1926, should receive the recognition and admiration of the whole medical profession.

Roderick Alexander Macleod was born on October 13, 1861, in Cambridge, England. His father was a bank manager and the son was born in the bank building. Five years later his parents determined to seek fresh climes and journeyed to New Zealand. He spent his boyhood in the Dominion. He went to school in Dunedin and distinguished himself both at work and at play. He attained some fame as a shot and a long distance runner. In due course he chose medicine as a career and his parents selected the Glasgow University for his training. After a successful course he graduated in the year 1887 with honours in medicine. He studied under George Macleod and Gairdner and many other well known teachers of the day. He returned to New Zealand in 1888 and at an early date was appointed Medical Superintendent at the Southland Hospital, Invercargill. In this capacity he acquired considerable experience as a surgeon and made full use of his skill and judgement. He was placed in charge of the old men's home and gaol when he entered private practice and he gained the high esteem of his colleagues and respect and confidence of his numerous patients. During the fourteen years of his activity in Invercargill he extended his knowledge of his profession and his manipulative prowess as a surgeon. His sense of duty impelled him to join the Oreti Rifle Volunteers, in which he attained to the rank of Surgeon Captain. He took a delight in the musical affairs of the city, was a church chorister and was actively associated with all the musical movements. He was a fine pianist and a good violinist. Even during this busy life he found time for daily study. In 1901 he returned to Scotland and took the degree of doctor of medicine at the Glasgow University. For some time he remained in the old country, but in 1912 he decided to return to the other side of the earth. He arrived at Brisbane but soon wandered as far north as Ravenswood, a prosperous mining town with about two thousand inhabitants. While the mines were being worked things went well, but as is not unusual in mining districts, prosperity is followed within a short space of time by inactivity and depression. The mines closed down and the population dwindled. At this period a vacancy occurred at the Gympie Hospital. The medical superintendent, Dr. L. Morris, had resigned. Roderick Alexander Macleod secured the appointment. Although he was allowed to engage in general private practice, he found that his work in the hospital absorbed so much of his energies and time that he restricted his private work to consulting practice. His hospital patients were thus immeasurably the gainers. He devoted himself to their needs, found time to read current medical literature, remained a serious student and gave his patients the benefits of his ever increasing knowledge. The institution under his control improved in a thousand ways. He soon gained a great reputation throughout the whole of Central Queensland as a physician with admirable wisdom, sound judgement and human sympathies. He was immensely popular as a citizen, beloved as a friend and respected as a colleague. His widow, to whom the sympathy of the medical profession is extended, has lost the best of husbands and his two daughters and son of his first marriage and one daughter of his second marriage have lost an ideal father.

Naval and Military.

APPOINTMENTS.

THE undermentioned appointments, changes *et cetera* have been promulgated in the *Commonwealth of Australia Gazette*, Numbers 81, 83, 94, 102, 103 and 104 of September 24, October 1, November 5 and 26, December 3 and 10, 1925.

**PERMANENT NAVAL FORCES OF THE COMMONWEALTH
(SEA-GOING FORCES).**

Transfer to Retired List.—Surgeon-Lieutenant Arthur Robert Hill M.B., Ch.B., M.C., is transferred to the Retired List, dated 6th September, 1925.

AUSTRALIAN MILITARY FORCES.

Australian Army Medical Corps, Permanent.

Colonel G. W. Barber, C.B., C.M.G., D.S.O., V.D., is granted the temporary rank of Major-General whilst holding the appointment of Director-General of Medical Services.

Army Headquarters.

Lieutenant-Colonel T. E. V. Hurley, C.M.G., Australian Army Medical Corps, is reappointed Assistant Director of Medical Services, 1st September, 1925.

Major (provisionally) M. J. Holmes, D.S.O., Australian Army Medical Corps, is reappointed Director of Hygiene, 1st September, 1925.

First Military District.

Eleventh Mixed Brigade—Staff.

Colonel A. G. Butler, D.S.O., Australian Army Medical Corps, is reappointed Assistant Director of Medical Services, Fifth Divisional Headquarters, 1st September, 1925.

First District Base—Staff.

Colonel A. H. Marks, C.B.E., D.S.O., Australian Army Medical Corps, is reappointed Deputy Director of Medical Services, District Base Headquarters, 1st August, 1925.

Major J. V. J. Duhig, Australian Army Medical Corps, is appointed Assistant Director of Hygiene, District Base Headquarters, 1st September, 1925.

Major W. R. Kelly, Australian Army Medical Corps, relinquishes the appointment of Assistant Director of Hygiene, District Base Headquarters, 31st August, 1925.

Australian Army Medical Corps.

To be Captain (provisionally).—Joshua Norman Woodhead, 31st July, 1925.

Major W. R. Kelly is transferred to the Unattached List, 1st September, 1925.

To be Captain (provisionally).—Honorary Captain O. E. J. Murphy, from the Australian Army Medical Corps Reserve, 1st November, 1925.

Captain (provisionally) J. N. Woodhead, is transferred to the Australian Army Medical Corps Reserve, and to be Honorary Captain, 3rd November, 1925.

Australian Army Medical Corps Reserve.

Captain P. J. B. Murphy is transferred to the Australian Army Medical Corps Reserve, Second Military District, 1st October, 1925.

Reserve of Officers.

Captain R. Thompson, M.C., is transferred to the Reserve of Officers, Second Military District, 10th September, 1925.

Second Military District.

First Cavalry Division—Staff.

Lieutenant-Colonel (Temporary Colonel) A. H. Tebbutt, D.S.O., Australian Army Medical Corps, is reappointed Assistant Director of Medical Services, Divisional Headquarters, 1st August, 1925.

Second Cavalry Division—Staff.

Colonel R. J. Millard, C.M.G., C.B.E., Australian Army Medical Corps, is reappointed Assistant Director of Medical Services, Divisional Headquarters, from 1st August, 1925, to 21st May, 1926.

District Base—Staff.

Colonel F. A. Maguire, D.S.O., Australian Army Medical Corps, is reappointed Deputy Director of Medical Services, District Base Headquarters, 1st August, 1925.

Captain (Temporary Major) H. Sutton, O.B.E., Australian Army Medical Corps, is reappointed Assistant Director of Hygiene, District Base Headquarters, 1st September, 1925.

Australian Army Medical Corps.

Captain H. G. Leahy is appointed from the Australian Army Medical Corps Reserve, 18th September, 1925.

The resignation of Captain G. Archbold of his provisional appointment is accepted, 17th September, 1925.

To be Captains (provisionally).—Lieutenants W. J. F. Douglas, from the Reserve of Officers, 1st September, 1925; and Edmund MacArthur Sheppard, 10th September, 1925.

The provisional appointment of Captain E. M. Sheppard is terminated under the provisions of Section 15 of the *Defence Act*, 9th September, 1925.

To be Captain (provisionally).—Thomas Moore Greenaway, 20th October, 1925.

Lieutenant-Colonel R. Dick, V.D., relinquishes the command of the Fourth Cavalry Field Ambulance, 15th October, 1925, and is placed upon the Retired List with the honorary rank of Colonel, and with permission to wear the prescribed uniform, 16th October, 1925.

To be Captain (provisionally).—Archibald James Cunningham, 12th November, 1925.

Australian Army Medical Corps Reserve.

Captains J. W. Smith, E. W. Frecker, H. O. Maher and K. M. Garrett, and Lieutenants W. H. Ross, G. F. Everett and G. H. Long, M.M., are transferred from the General List of the Reserve of Officers, 1st July, 1925.

Captain P. J. B. Murphy is transferred from the Australian Army Medical Corps Reserve, 1st Military District, 1st October, 1925.

Honorary Captain H. E. Lee is retired under the provisions of the Australian Military Regulation 152 (1), 25th September, 1925.

Captain T. E. Marshall is placed upon the Retired List with permission to retain his rank and wear the prescribed uniform, 2nd November, 1925.

Reserve of Officers.

Captain R. Thompson, M.C., is transferred from the Reserve of Officers, First Military District, 10th September, 1925.

Third Military District.

Second Cavalry Division—Staff.

Colonel R. Fowler, O.B.E., V.D., Australian Army Medical Corps, is reappointed Assistant Director of Medical Services, Divisional Headquarters, 1st August, 1925.

Third Cavalry Division—Staff.

Colonel W. E. Summons, O.B.E., V.D., Australian Army Medical Corps, is reappointed Assistant Director of Medical Services, Divisional Headquarters, 1st August, 1925.

Fourth Cavalry Division—Staff.

Colonel C. G. Shaw, D.S.O., V.D., Australian Army Medical Corps is reappointed Assistant Director of Medical Services, Divisional Headquarters, 1st August, 1925.

District Base—Staff.

Colonel R. M. Downes, C.M.G., V.D., Australian Army Medical Corps, is reappointed Deputy Director of Medical Services, District Base Headquarters, 7th July, 1925.

Australian Army Medical Corps.

Lieutenant I. H. Cowling is transferred (provisionally) from the Melbourne University Rifles, Fourth Division, 28th August, 1925.

The provisional ranks of Captain D. L. Yoffa and Lieutenant J. G. Hayden are confirmed.

To be Captain (provisionally).—Honorary Captain T. K. R. Allen from the Australian Army Medical Corps Reserve, 25th November, 1925.

Australian Army Medical Corps Reserve.

Majors H. H. Wollard and A. J. Brenan, Captain W. F. Stephens are transferred from the General List of the Reserve of Officers, 1st July, 1925.

Honorary Captain E. F. O'Sullivan and Honorary Lieutenant R. J. Roche are retired under the provisions of Australian Military Regulation 152 (1), 7th December, 1925, and 17th November, 1925, respectively.

Honorary Captain F. Tipping is transferred to the Australian Army Medical Corps Reserve, Fifth Military District, 20th November, 1925.

Captain J. Wall is transferred to the Australian Army Medical Corps Reserve, Second Military District, 1st November, 1925.

Fourth Military District.

District Base—Staff.

Colonel S. R. Burston, C.B.E., D.S.O., Australian Army Medical Corps, is reappointed Deputy Director of Medical Services, District Base Headquarters, 1st August, 1925.

Major L. W. Jeffries, D.S.O., O.B.E., Australian Army Medical Corps, is reappointed Assistant Director of Hygiene, District Base Headquarters, 1st September, 1925.

Australian Army Medical Corps.

Captain R. C. Bassett is brought on the authorized establishment, 1st August, 1925.

Fifth Military District.

District Base—Staff.

Major J. Dale, O.B.E., Australian Army Medical Corps, is reappointed Assistant Director of Hygiene, District Base Headquarters, for a period of one year from 2nd September, 1925.

Australian Army Medical Corps Reserve.

Honorary Captain M. Richards is retired under the provisions of Australian Military Regulation 152 (1), 30th October, 1925.

To be Honorary Captain.—Henry Lyon Johnston, 11th November, 1925.

Honorary Captain F. Tipping is transferred from the Australian Army Medical Corps Reserve, Third Military District, 20th November, 1925.

Unattached List.

Captain C. W. Courtney is transferred from the Australian Army Medical Corps, Third Military District, 1st September, 1925.

Sixth Military District.

Twelfth Mixed Brigade—Staff.

Major C. G. Thompson, Australian Army Medical Corps, is reappointed Deputy Assistant Director of Medical Services, Mixed Brigade Headquarters, for a period of one year from 1st September, 1925.

District Base—Staff.

Colonel W. W. Giblin, C.B., V.D., Australian Army Medical Corps, is reappointed Deputy Director of Medical Services, District Base Headquarters, 1st August, 1925.

Captain (Temporary Major) C. N. Atkins, Australian Army Medical Corps, is reappointed Assistant Director of Hygiene, District Base Headquarters, for a period of one year from 1st September, 1925.

Australian Army Medical Corps Reserve.

Major J. McPherson is transferred from the Australian Army Medical Corps Reserve, Second Military District, 1st December, 1925.

Congress Notes.

AUSTRALASIAN MEDICAL CONGRESS (BRITISH MEDICAL ASSOCIATION).

THE following information has been forwarded to us by Professor W. P. Gowland, Honorary General Secretary of the second session of the Australasian Medical Congress (British Medical Association), Dunedin, 1927.

Office Bearers.

Dr. E. S. Meyers has been appointed Honorary Local Secretary of the Congress for Queensland, in the place of Dr. R. Marshall Allan, who resigned his position in November, 1925.

During the absence from Australia of Professor A. E. Mills the duties of President of the Section of Medicine will be carried out by Dr. A. L. Collins.

We regret that a typographical error occurred in the list of Presidents of Sections published in this journal on December 5, 1925, page 666. The President of the Section of Naval and Military Medicine and Surgery is Major-General G. W. Barber, C.B., C.M.G., D.S.O.

The Congress Museum.

The Museum of the Congress has been placed under the control of a museum committee. The convenor of this committee is Professor Gordon Bell, Medical School, Great King Street, Dunedin. All communications and inquiries should be addressed to him.

It is proposed to organize a collection of anatomical and pathological specimens, of skiagrams, of apparatus and of other medical exhibits. The following subjects are suggested as suitable for illustration by exhibits: Public health problems including goitre, various aspects of hydatid disease, congenital abnormalities, problems in forensic medicine, diverticula of the alimentary tract, diseases of bone, plastic surgery, ophthalmic conditions. Casts of anatomical preparations and specimens of interesting or rare pathological conditions should be included in the collection. It is hoped that many of the specimens exhibited at the Ophthalmological Congress, London, 1925, will be displayed at Dunedin.

The regulations formulated by the Museum Committee are as follows:

1. Intending exhibitors must give full information in regard to the exhibits suggested for inclusion in the museum on forms supplied. Exhibitors are requested to send in the forms by October 31, 1926; those received after this date will not be considered, save under special circumstances.

2. All forwarded exhibits must be received, properly packed, at the Medical School, Great King Street, Dunedin, by December 31, 1926, in order that the museum may be arranged by January 25, 1927.

3. Exhibitors intending to bring their exhibits with them personally must give notification when sending in their forms. It is essential that such exhibits be handed in and arranged not later than the opening day of Congress, Wednesday, February 2, 1927.

4. The committee has the absolute right of acceptance or refusal of the exhibits.

5. The committee reserves to itself the right of arranging the exhibits.

6. The committee shall be responsible for the proper exhibition of the several exhibits and for their secure packing and dispatching on return. All exhibits will be insured and all claims for compensation for damage or loss must be made within three months of the closure of the museum.

7. No exhibit of a commercial nature shall be included in the museum.

8. Any exhibitor making a communication to a section may arrange with the committee for his specimens to be available at the sectional meetings.

9. Exhibitors may demonstrate their specimens in the museum.

10. No specimen may be removed from the museum without the consent of the committee.

Intending exhibitors should apply to Professor Bell at once for application forms with which will be sent instructions for sending specimens and a copy of the regulations.

IMPORTANT information for those who hope to attend the second session of the Australasian Medical Congress (British Medical Association), Dunedin, 1927, will be published in this journal some time in April. In the same issue a form of application for membership will be found. This form should be filled in, detached and forwarded at once in order to facilitate the work of the Executive Committee.

COUNTRY HOSPITALS IN QUEENSLAND.

We have been requested by the Council of the Queensland Branch of the British Medical Association to draw the attention of applicants for positions in country hospitals in Queensland to the fact that, although the right of private practice is frequently held out as an inducement, the private practice in many of the districts is so small that it does not represent a material financial attraction. They are therefore advised to make inquiries of the Honorary Secretary of the Queensland Branch of the British Medical Association before sending in their applications for positions in these country hospitals.

Medical Appointments.

Dr. C. R. Dunkley (B.M.A.) has been appointed Senior Resident Medical Officer, Fremantle Public Hospital, Western Australia.

Dr. A. Jacobs (B.M.A.) has been appointed Junior Resident Medical Officer, Fremantle Public Hospital, Western Australia.

Dr. S. O. Cowen (B.M.A.) has been appointed Independent Lecturer in Therapeutics, University of Melbourne.

Books Received.

AN ELEMENTARY COURSE IN TROPICAL HYGIENE, by Mary G. Blacklock, M.B., B.Sc., D.T.M.; Preface by Andrew Balfour, C.B., C.M.G., M.D., B.Sc., F.R.C.P.; Part I.; 1926. London: John Bale, Sons and Danielsson, Limited. Crown 8vo., pp. 44. Price: 1s. net.

AN INTRODUCTION TO SURGERY, by Rutherford Morison, M.D., F.R.C.S. (Edinburgh), F.R.C.S. (England), M.A., D.C.L., LL.D. and Charles F. M. Saint, C.B.E., M.D., M.S., F.R.C.S. (England); Second Edition; 1925. Bristol: John Wright and Sons, Limited. Demy 8vo., pp. 347, with illustrations. Price: 15s. net.

PRACTICAL PHYSIOLOGICAL CHEMISTRY, by Sydney W. Cole, M.A.; Seventh Edition; 1926. Cambridge: W. Heffer and Sons, Limited. Demy 8vo., pp. 479. Price: 16s. net.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser," page xxii.

CAIRNS HOSPITALS' BOARD: THE CAIRNS DISTRICT HOSPITAL: Junior Resident Medical Officer.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C. 1.

| BRANCH. | APPOINTMENTS. |
|--|---|
| NEW SOUTH WALES: Honorary Secretary, 30 - 34, Elizabeth Street, Sydney. | Australian Natives' Association. Ashfield and District Friendly Societies' Dispensary. Balmmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham Dispensary. Manchester United Oddfellows' Medical Institute, Elizabeth Street, Sydney. Marrickville United Friendly Societies' Dispensary. North Sydney United Friendly Societies. People's Prudential Benefit Society. Phoenix Mutual Provident Society. |
| VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne. | All Institutes or Medical Dispensaries. Australian Prudential Association Proprietary, Limited. Mutual National Provident Club. National Provident Association. |
| QUEENSLAND: Honorary Secretary B.M.A. Building, Adelaide Street, Brisbane. | Brisbane United Friendly Society Institute. Stannary Hills Hospital. |
| SOUTH AUSTRALIAN: Honorary Secretary, 12, North Terrace, Adelaide. | Contract Practice Appointments at Ceduna, Wudinna (Central Eyre's Peninsula), Murat Bay and other West Coast of South Australia Districts. |
| WESTERN AUSTRALIAN: Honorary Secretary, Saint George's Terrace, Perth. | All Contract Practice Appointments in Western Australia. |
| NEW ZEALAND (WELLINGTON DIVISION): Honorary Secretary, Wellington. | Friendly Society Lodges, Wellington, New Zealand. |

Diary for the Month.

- MAR. 30.—New South Wales Branch, B.M.A.: Council.
 APR. 1.—South Australian Branch, B.M.A.: Council.
 APR. 6.—Tasmanian Branch, B.M.A.: Council.
 APR. 7.—Victorian Branch, B.M.A.: Branch.
 APR. 7.—Western Australian Branch, B.M.A.: Council.
 APR. 8.—Victorian Branch, B.M.A.: Council.
 APR. 8.—New South Wales Branch, B.M.A.: Clinical Meeting.
 APR. 9.—Queensland Branch, B.M.A.: Council.
 APR. 13.—Tasmanian Branch, B.M.A.: Branch.
 APR. 13.—New South Wales Branch, B.M.A.: Ethics Committee.
 APR. 19.—New South Wales Branch, B.M.A.: Organization and Science Committee.
 APR. 20.—Tasmanian Branch, B.M.A.: Council.
 APR. 20.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
 APR. 21.—Western Australian Branch, B.M.A.: Branch.
 APR. 23.—Queensland Branch, B.M.A.: Council.
 APR. 27.—New South Wales Branch, B.M.A.: Medical Politics Committee.
 APR. 28.—Victorian Branch, B.M.A.: Council.
 APR. 29.—New South Wales Branch, B.M.A.: Branch (Ordinary)

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

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